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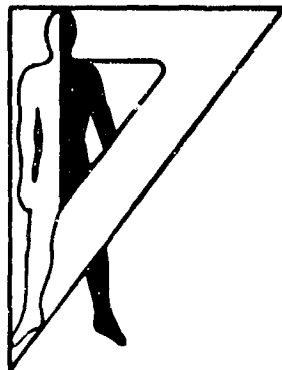
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Technical Memorandum 12-82

RECENT MILITARY OPERATIONS ON URBAN TERRAIN

R. D. McLaurin
Lewis W. Snider

July 1982
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Both battles underscore the importance of preparing a city for defense and the significant force multiplier effect offered by the cityscape to defenders thus prepared. The problems facing employment of air and artillery in cities, and the value of rational lines of command, control, and communications appropriate to urban warfare are also highlighted by these examples.

RECENT MILITARY OPERATIONS ON URBAN TERRAIN

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July 1982

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PREFACE

The purpose of this report is to elucidate the lessons for military operations on urban terrain (MOUT) that may be derived from the Battle of Jerusalem, June 1967, and the Battle of Suez City, October 1973. The latter greatly influenced Israeli thinking about urban combat, and the former has stood out as one of the major recent examples of the defensive assets the cityscape presents for a well-prepared defender.

We would like to express our appreciation to Donald O. Egner and Ellsworth Shank of the U. S. Army Human Engineering Laboratory, Aberdeen Proving Ground, which sponsored the research; to the embassies of the Arab Republic of Egypt and the State of Israel which helped arrange visits to those two countries; to two of the senior commanders in the Battle of Suez City, Egyptian Brigadier 'Abd al-Aziz Qabil and Israeli Major General Bren Adan, who gave unstintingly of their time for interviews; to Major General M. D. Zohdy (ret.), al-Ahram Center for Strategic and International Studies; General Abdel Hakim Ebeid, Ministry of National Defense, Cairo; Meir Pail; Abraham Rabinovich, Jerusalem Post; and especially to Col. Trevor H. Dupuy (ret.) whose help in establishing contacts in Egypt and Israel was of inestimable value.

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EXECUTIVE SUMMARY

This study assesses two recent battles in the Middle East from the perspective of military operations on urban terrain (MOUT). The battles took place in Jerusalem and Suez City. In the present report, each battle is presented in a similar manner--significance of the battle, description of the environment, combatants' resources, the tactical situation, concepts of operations, tactical plan, operations, outcome, findings. Comparability between the two battles has been maximized. A final substantive chapter compares the two cases and the findings and conclusions that might be drawn from each and from the two taken together.

The sources of information for this study are interviews conducted in Washington D.C., Tel Aviv, and Cairo; questionnaires completed by interviewers or respondents; and published accounts of the battles by participants, observers, or others who interviewed participants.

Both Jerusalem and Suez City battles were fought as part of general Arab-Israeli wars. Neither battle was the most significant engagement of the larger conflict. In each case there were other instances of city fighting (though no major instances in 1973), but Jerusalem and Suez were clearly the most important examples of MOUT in the 1967 and 1973 Middle East wars, respectively.

The attacker in both cases was a fully mobilized Israeli army that enjoyed theater air superiority. Israel enjoyed great momentum at the time of each engagement, numerical superiority in armor, and far greater mobility. Although a majority of the offensive forces were reservists (as the IDF is principally a reserve army), they were constituted in regular armed forces units and behaved as regulars. By contrast, the majority of the forces defending Jerusalem and Suez were irregulars or scarcely-trained reservists. However, there were also marked differences between the two cases. For example, Israelis attacking Jerusalem were intimately familiar with the city. Jordanian army defenders were not as familiar with the city. By contrast, no IDF personnel in the attacking forces were familiar with Suez, while most of the defenders lived there.

Another difference between the two cases resulted from the cultural value of Jerusalem. Because of its religious importance, neither Israel nor Jordan was prepared to see the city destroyed. Consequently, Israeli forces operated in constant awareness of the need to avoid undue destruction and restrict fire.

Preparation of the city for defense appears to be more important than any other single variable in explaining the differential effectiveness of the resistance in Jerusalem and Suez. In the former case, there was no preparation for hostilities by the Jordanians until the eve of the war, and very little even then. Local militias were not armed, buildings were not sandbagged, provisions not stockpiled. Apart from some minor, last-minute fortification efforts, Jerusalem was unprepared for war. In this respect the contrast with Egyptian preparation of Suez could not be more complete.

The Egyptians had begun to prepare for an attack on Suez a full year before the October War. Buildings had been demolished; kill zones demarcated; streets blocked; the populace armed, organized, and trained; and a realistic defensive plan developed.

The IDF doctrine for MOUT relied heavily on the use of armor in built-up areas in both 1967 and 1973. This reliance derived from the overall force structure of the IDF which was not designed principally for combat in urban areas and, in the case of Suez, was encouraged by the effectiveness of armor in Jerusalem and elsewhere.

Between 1967 and 1973 the IDF armored corps developed and refined its tactical concepts for MOUT, and began to instruct officer cadres, using live-fire exercises in real cities. However, less attention was given to combined arms training, and therefore paratroop and infantry practices diverged sharply from armored doctrine. This neglect of combined arms operations was clearly visible in Suez City where armored forces, when ambushed, pushed ahead to the next objective while the paratroops dismounted their vehicles to fight in nearby structures.

In both the Old City of Jerusalem and Suez City, narrow streets impassable to tanks and APCs impeded or arrested the IDF advance, and in the latter, where the tank kill zones were engineered in advance, the narrow streets became alleys of death. Artillery had little effect on offense or defense, although both sides employed some artillery.

The Suez City battle demonstrated the importance of C³, as had the Jerusalem experience six years earlier. In Jerusalem the decentralized but clear-cut Israeli lines of authority were highly effective for the small-unit operations of a city. By contrast, Jordanian command and control were not effectively integrated with the result that the senior local commander could not secure available armor or artillery support from units within his area of responsibility (but not under his command). These differences were exacerbated by Israeli communications superiority which allowed the IDF to intercept Jordanian communications, while the Jordanian commander was unable to communicate regularly with his own higher headquarters and other nearby units.

In Suez, IDF command and control was once again relatively decentralized but with very clear-out lines of authority. Even after a disastrous ambush, effective Israeli communications probably saved the units involved, overcoming the severe handicaps caused by poor tactical organization and the resulting cutting off of three elements of the attacking force. Although radio communications from inside buildings was problematical at first, once order was restored units within the city were able to reach several echelons of IDF command.

The Egyptian defenders acted on an almost individual basis, and command and control was scarcely tactical during combat. Operations were virtually unconventional in nature--in the urban guerrilla mold. The use of runners, telephone, and other highly appropriate communications channels characterized the defensive effort. Similarly, the command and control of the defenders, carefully organized long before the battle, integrated regular and irregular resources very effectively.

In both Jerusalem and Suez, defenders surrendered buildings to the attacking Israelis, only to re-occupy them once the buildings were cleared. This aspect of urban operations complicated the attacker's job by providing a constantly shifting battlefield situation in which there is no secure area. Although the IDF used flags in Jerusalem to indicate "secured" structures, the flags could not prevent Jordanians from re-entering. In Suez, the proximity of buildings complicated this task even more, since cleared buildings could be re-entered at multiple levels by balconies or rooftops.

As in Beirut, holes were punched through walls in Jerusalem to facilitate the movement of men and materiel without exposing them to enemy fire. In addition tunnels, originally dug for the 1948-1949 battle of Jerusalem, were used to move supplies forward and, in some cases, to remove the wounded.

Jerusalem and Suez were excellent examples of the combat advantages MOUT confers upon the defender and of the importance of advance planning and preparation in extracting the maximum benefit from those advantages. Even with better organization and other tactics, attacking Israeli forces would have been hard-pressed to capture well-prepared Suez without taking heavy casualties. Jerusalem, on the other hand, an inherently more defensible city, was occupied well within tolerable casualty limits, largely because the defenders were unprepared for war.

ABBREVIATIONS

AA	antiaircraft (gun)
AAA	antiaircraft artillery (same as AA gun)
APC	armored personnel carrier
AT	antitank
ATGM	antitank guided missile
bde	brigade
bn	battalion
C	command, control, and communications
CAS	close air support
CP	command post
cy	company
FEBA	forward edge of the battlefield area
HQ	headquarters
IAF	Israel Air Force
IDF	Israeli Defense Forces
m	meter
mm	meters
MOBA	military operations in built-up areas
MOUT	military operations on urban terrain
TOE	table of organization and equipment
UN	United Nations
UNRWA	United Nations Relief and Works Agency
UNTSO	United Nations Truce Supervisory Organization

RECENT MILITARY OPERATIONS ON URBAN TERRAIN

INTRODUCTION

This study assesses two recent battles in the Middle East from the perspective of military operations on urban terrain (MOUT). The battles involved are Jerusalem (1967) and Suez (1973). In both cases Israeli forces constituted the offensive force. Both battles had far-reaching political, economic, and military consequences. In both instances, a tactically superior attacking force confronted underequipped defenders. And in each case the attacker was more conscious of MOUT as a military concept than the defender. However, the battle outcomes were dramatically different.

In the report, each battle is presented in a similar manner--significance of the battle, description of the environment, combatants' resources, the tactical situation, concepts of operations, tactical plan, operations, outcome, findings. Comparability between the two battles has thus been maximized. A final substantive chapter compares the two cases and the findings and conclusions that might be drawn from each and from the two taken together.

The sources of information for this study are interviews conducted in Washington, D.C., Tel Aviv, and Cairo; questionnaires completed by interviewers or respondents; and published accounts of the battles by participants, observers, or others who interviewed participants. Like others before us, we encountered irreconcilable differences in accounts regarding both Jerusalem and Suez, and we have tried to choose the most plausible course in arbitrating these differences. In the case of Suez, we set various temporal parameters to the battle, for many of the discrepancies occurred before the main assault or, more commonly, after the withdrawal of the 217th IDF Armored Brigade. In the case of Jerusalem, such simple editorial devices to narrow the gaps were unavailable, but significant data were also less discrepant.

A bibliography lists the published sources used in this study. The final section consists of the questionnaires employed to collect and order data.

THE BATTLE OF SUEZ CITY

Significance of the Battle

The battle for Suez City occurred during the closing days (October 24-28) of the October 1973 Middle East War. Suez City was tactically important because it sat astride the Egyptian Third Army's only line of communication, which the Israeli Army was determined to sever. It was strategically important as it controlled the southern entrance to the Suez Canal. The city was politically important since it was the key to claims of both combatants as to territory under their respective control. Seizure of the city by the Israeli Defense Forces (IDF) would have supported Israel's claims of having completely encircled the Third Army and severed its lines of communications with the west bank of the Suez Canal. Israel's capture of the city would also have quashed Egypt's claims to be on the verge of eliminating what is described as "infiltrating Israeli raiding parties" and would have established Israeli control over the area in the eyes of the United Nations truce observers. The latter were tasked with implementing the ceasefire and marking zones controlled by each army. Failure of the IDF to establish its control over the area increased the possibility of UN recognition of Egypt's claims and so diminished the political impact of Israel's recent military gains. Egypt was largely successful in beating back the Israeli attack.

Description of the City

Before 1967, Suez City was the fourth largest city of Egypt with a population of approximately a quarter million persons. After October 1967, artillery exchanges between Egyptian forces on the west bank of the Suez Canal and Israeli forces occupying the east bank resulted in the large-scale evacuation of most civilian residents of the city. Of the remaining civilian population, two thirds were evacuated about one year before the war. Those who remained were essential to the city--police, fire, and other officials, medical personnel, bankers, and so forth.

Suez, itself, was a city consisting of several sectors rather disconnected from each other. To the west southwest of the downtown area was a large industrial area consisting primarily of oil facilities and secondarily of other small industrial plants and activities. Directly south of and adjacent to the industrial area is an oil port. The city also boasted two other ports--Ibrahim and Taufiq--at the end of a long causeway extending southeast from the downtown area as an extension of its principal thoroughfare. The central city area was bounded on one side by the principal road and on the other by the Gulf of Suez along the edge of which lay a corniche. Near the corniche were a number of government structures such as the governorate building and customs office. The major intersection of the city is at the "Mosque of the Forty" (Jami' el-Arba'in), where the road to Cairo and the road to Ismailia, as well as the railroad line to Cairo, all merge.

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This is a detailed black and white map of Baghdad, Iraq, showing the Tigris River, major roads, and various districts. The map includes a grid with coordinates and labels for locations such as 'Baghdad', 'Tigris River', 'Baghdad International Airport', and 'Baghdad Railway Station'. The map is oriented with North at the top.

The map shows the Tigris River flowing through the city, with several bridges crossing it. Major roads and highways are depicted with thick lines. The city is divided into various districts, including the Old City, the New City, and the International Airport. The map also shows the Baghdad Railway Station and the Baghdad International Airport. The map includes a grid with coordinates, with the horizontal axis labeled from 1 to 10 and the vertical axis labeled from 1 to 10. The map is oriented with North at the top.

Key locations and features labeled on the map include:

- Baghdad
- Tigris River
- Baghdad International Airport
- Baghdad Railway Station
- Old City
- New City
- Baghdad International Airport
- Baghdad Railway Station
- Old City
- New City

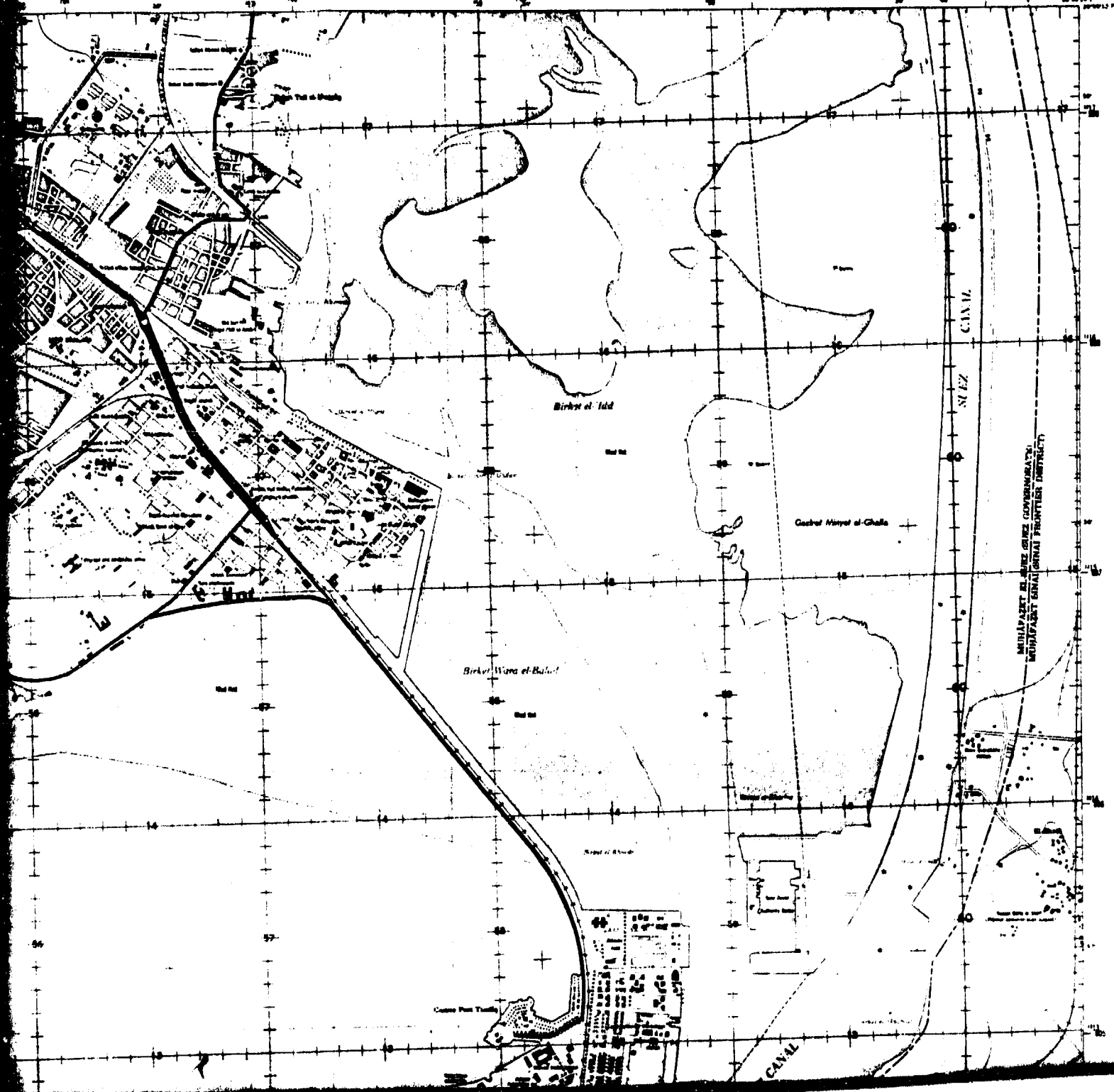
The map is a detailed representation of the city of Baghdad, showing its geographical features, infrastructure, and administrative divisions. It is a valuable resource for understanding the city's layout and for planning travel or other activities.

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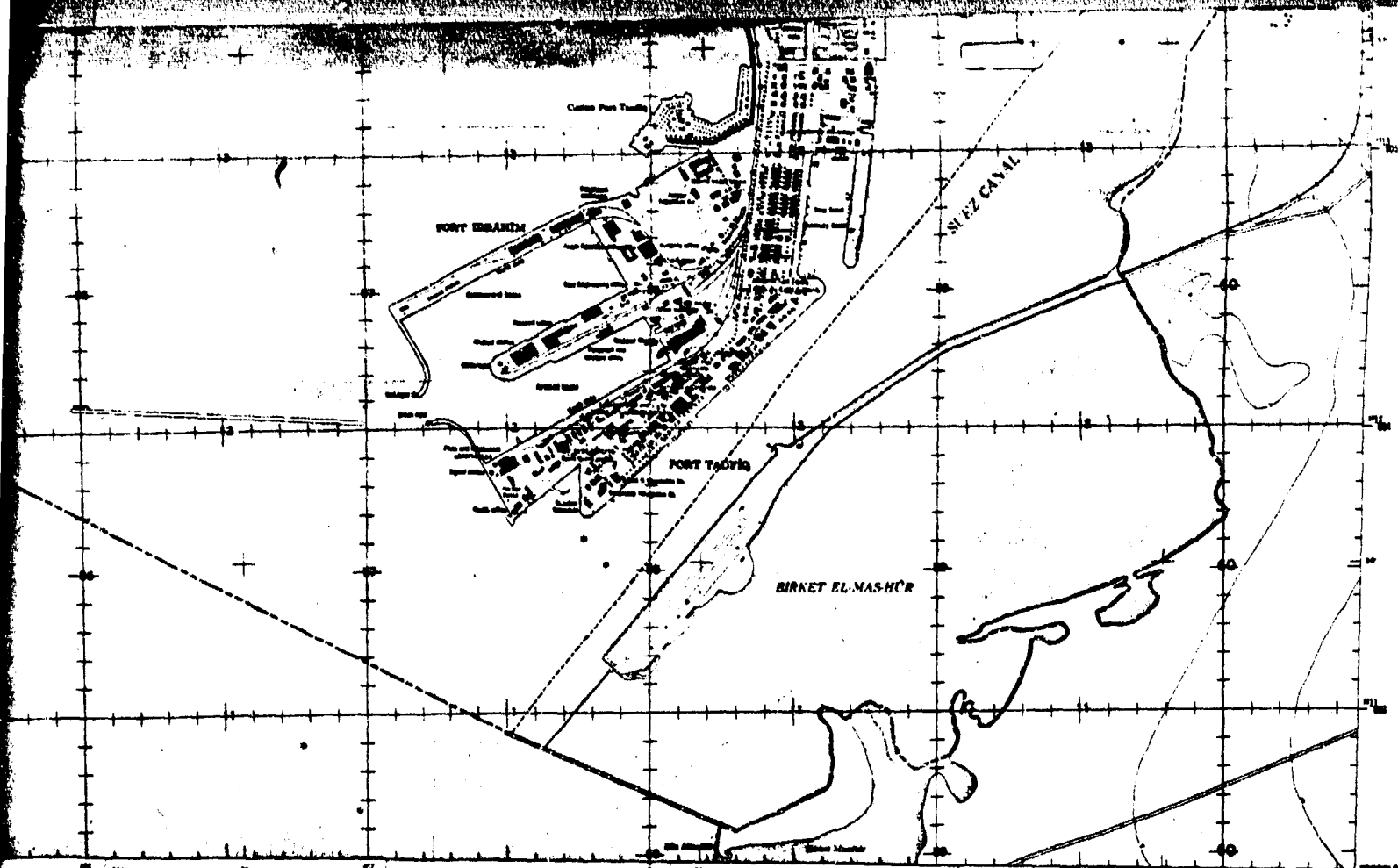
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SUEZ AND ENVIRONS

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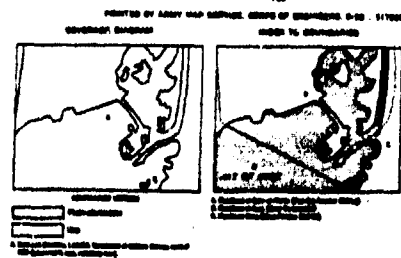
MINISTRY OF SUEZ CANAL (GOVERNMENT)
MISRAHAT SUEZ (SUEZ FRONTIER DISTRICT)



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1. Suez and Environs



SUEZ AND ENVIRONS, EGYPT

1. Suez and Environs

24

The street pattern in most of Suez City is highly irregular but the few main streets are very wide. For example, the buildings on either side of Route 33 leading to Cairo are separated by up to 75 meters. These main streets are relatively straight, allowing the use of antitank guided missiles (ATGMs) and other direct-fire weapons at ranges not usually found in cities.

There are three main routes into the city: one from Ismailia to the north (the Ismailia Road, Route 41 or "Havit Road" to the IDF); one from Cairo to the northwest (Route 33); and one to the south (the Zaytiyyat Road). Outside the city the road from Ismailia is an asphalt road just wide enough to accommodate one column of tanks. The road from Cairo is wide enough for at least two columns of tanks outside the city. Within the city proper it widens into a very broad avenue that leads to the center of the city in a southeasterly direction. Along most of its urban section, the road consists of two lanes divided by a railroad line that is protected on either side by a concrete strip 30 cm. high. The road from Adabiah enters the city from the south, but branches north into an industrial area and south toward the ports (Ibrahim and Tawfiq) rather than leading directly to the heart of the city.

Most of the buildings in Suez City are dried mud and stucco residences of two or three stories. Government and some office buildings are made of reinforced concrete and brick. The several major apartment buildings (five to eight stories) are made of reinforced concrete and are situated in rows of four to six. Their upper stories had been heavily damaged by Israeli artillery between 1967 and 1970.

Structures are characterized by flat roofs (with doors from within), large balconies on upper floors, large glass-free windows and French doors, spacious rooms, and very high ceilings. The result is excellent angles of fire, relatively good cover from shadows, and no back blast problem.

In residential areas the buildings are usually located 1 or 2 meters apart, so the streets are usually like alleys; too narrow for the easy passage of vehicles. Vehicles can negotiate some side streets, especially just off main avenues, but are usually forced to turn and double back as the streets narrow. While there are no sewers or other underground passageways, the close proximity of buildings in many areas allows combatants to advance or withdraw by simply stepping from roof to roof.

The Combatants

In this section we consider the resources both parties--Egypt and Israel--brought to Suez City, including personnel, equipment, and dedicated support resources.

Israel

The IDF ground forces committed to the battle included two armored "brigades" minus organic infantry but reinforced by two paratroop "battalions" (160 or more men), one mechanized reconnaissance "battalion" (only 150 soldiers), one tank company, and a reduced armored infantry battalion. The infantry components arrived just before the battle and were principally reserves. Support included two medical companies organic to Adan's division, two nearby artillery battalions and one "intermediate" 175mm artillery battalion on the east bank of the canal, and some aircraft.

Major equipment items were available as follows (figures approximate):

<u>Unit</u>	<u>Equipment</u>
2 armored brigades (committed elements)	105 tanks 35 "Zeldas" ¹ 40 half-tracks
1 brigade scout company	7 "Zeldas"
2 paratroop battalions	2 half-tracks 3 trucks 3 buses 9 "Topaz" ²
1 mechanized recon battalion	9 BTR-50s 3 unidentified tanks
2 medical companies	helicopters
1 armored infantry battalion	standard TOE but reduced by fighting
TOTAL:	108 tanks T-67 ³ , Centurion, "Ben-Gurion" ⁴ , "I-Patton" ⁵ , M-60A1, PT-76 60+ APCs "Zelda," "Topaz," BTR-50 42+ half-tracks 6+ civilian vehicles buses, trucks

¹"Zelda" is the name applied by IDF personnel to U. S.-manufactured M113s fitted with several (three or more) additional FN or, more commonly, .50-caliber machine guns.

²The "Topaz" is a captured BTR-50 fitted with IDF communications gear.

³The T-67 designation refers to T-54/T-55 tanks captured by the IDF in the June 1967 war and upgunned through the replacement of the original main tank gun by a French-made 105mm.

⁴"Ben-Gurion" refers to Centurions refitted with French-made 105mm guns.

⁵The "I-Patton" is an M-47 modified to M60A1 capabilities.

Egypt

The defending Egyptian forces comprised various elements of the 19th Infantry Division, including an antitank missile company; remnants of the 4th and 6th Divisions aggregating the equivalent of about two mechanized infantry battalions; a commando battalion stationed at Port Ibrahim; and the Third Armored Brigade of the Fourth Armored Division commanded by General 'Abd al-Aziz Qabil. Defense of the city, however, rested heavily upon those who lived there. Thus, the regular army units were augmented by a 2000-man militia tasked with the defense of the outer perimeter of the city except for its three main entrances. The militias were led by retired army officers and received regular training. A month before the beginning of the war the civilian militia was issued weapons and given stepped-up training. Artillery support and ground-based AD was provided by Egyptian Third Field Army elements on the east bank. Other air defense responsibilities lay with rearward elements of the Egyptian Air Defense Command.

Little is known about the numbers of Egyptian weapons systems employed. Principal items included the following:

Tanks

Tu-54/55, SU-100

Two tank bns on east bank

AAA

ZU-23/4, M53 Quad 12.7mm

Man-portable systems

RPG-7, Sagger, bazookas, 2" and 7"

HOUND, AK-47, "Hosam"⁶, machineguns

Other

Trucks, jeeps

The Situation

Notwithstanding the potential importance of the capture of Suez City, the decision to seize it was less than clear-cut. Negotiations to end the hostilities had already led to a ceasefire agreement when the decision was finally taken. The Israeli general in command of the sector, Avraham "Bren" Adan, characterizes the move as a "snatch-and-grab" operation designed to give the appearance of general Israeli control over the city. Such an appearance would have permitted the IDF to complete its seizure by justifying mop-up operations.

⁶ The "Hosam" is a shaped-charge grenade with adhesive or a magnetic base for attachment to armor plating.

When IDF Southern Command Headquarters made the decision to seize Suez City, the view at Headquarters and throughout the field command on the west bank of the canal was that the Egyptian Army was in retreat. While that Army was not being routed or fleeing in disarray, Israeli officers believed their enemy was retreating in recognition that it faced a superior force. According to this view, Egyptian armed forces personnel did not wish to battle the IDF. Consequently, Israeli officers felt they could capture all of the west bank of the canal without encountering any substantial opposition. Exceptions--the inability to capture Ismailia, for example--were not in Adan's area of responsibility, although units under his command had encountered scattered resistance in the marshy areas northeast of the city between Suez and Shalufa. Despite the Israeli officers' perception of a retreat by the Egyptian Army, Southern Command Headquarters' orders to MG Adan were to capture the city "provided it does not become a Stalingrad situation."

The mission given Adan's division was, therefore, to capture Suez City before the arrival of United Nations Truce Supervisory Organization (UNTSO) observers, who were expected to be in the area about 7 AM. However, the Southern Command decision was not taken, nor the order given, until the early hours of the 24th, about 1 AM--just a few hours before the anticipated arrival of UNTSO. Thus, Adan had to plan his attack, organize his forces, and carry out the operation in about 6 hours. (The operation need not have been completed in 6 hours, however, since all that was necessary was an appearance of control over the contested area, and engagement of his forces at key points in the city might pass for uncompleted "control.")

A major problem confronted by the local commander, General Adan, was the unavailability of adequate infantry personnel for the attack on Suez. The units that finally did participate in the battle were rushed to the area from other operations either initially or later as a result of the developing situation. These troops had not fought together, had not fought with armor, and operated under different concepts of how to fight in cities. Forward commanders also lacked different concepts of how to fight in cities.

Egyptian defenders also faced major problems. The Egyptian Army had not yet organized an effective counter to Israeli operations on the west bank of the canal, operations that were resulting in substantial psychological and military gains for the Israelis. Egyptian units on the west bank were surprised and often easily routed by the rapidly growing IDF offensive there. By October 24, Suez was a city cut off from the rest of Egypt except for a small bridgehead to the Third Army on the east bank of the Suez Canal.

The city's defenders, largely irregular forces with some regular elements who had recently arrived in the city as a result of the west bank fighting, had no organic artillery (except limited AAA and mortars), no air support, and virtually no armor. Some, seeing in the recent Israeli west bank counter attack a new 1967-style rout, began to fear the "invincible" Israeli Army.

Concept of Operations--Offense

The IDF had partially developed a doctrine for military operations on urban terrain (MOUT). In fact, however, the doctrine reflected the dominance of the armored branches of the IDF ground forces. Training films indicate that general staff planners felt fighting in cities must ultimately involve infantry. However, the IDF armored branches had evolved their own doctrine and had even carried out some live-fire training of armored officer cadres. The overall IDF doctrine, focussing on infantry, and that developed by armor were somewhat incompatible and typified IDF neglect of combined arms training between the June 1967 and October 1973 Wars.

According to the armored doctrine, fighting in built-up areas could easily be accomplished by armor and mechanized infantry, but the centerpiece of the tactical concept was armor, deployed in phases. In the first phase, armored units bypass the city cutting off all traffic routes connecting it with the environs. The second phase involved encirclement of the city while taking up positions dominating its outskirts and, if possible, key buildings inside the city as well. The third phase centered on an Israeli concept referred to as BUZZ--the creation of shock by rapid armored thrusts even in built-up areas. Armored columns comprised of alternating tanks and APCs, carrying engineering and other support units organic to the task force, move on parallel streets and concentrate a high volume of fire in all directions while staying on the move. APCs, which had been modified to mount three or more machineguns, concentrated their fire on higher elevations; tanks on the lower.

This employment of armor in MOUT was based on knowledge of the techniques of concentrating fire upwards and in all other directions and the capacity to maneuver and overcome street-blocking obstacles. In practice, this technique meant grouping combinations of tanks, armored infantry, and combat engineers in the smallest possible units. These formations were to advance in a column consisting of one tank, one APC, followed by another tank and another APC, and so forth. If the streets were wide enough, movement was to be in pairs or trios (platoons) of tanks and APCs alternately.

Moving several tanks abreast of one another, if possible, instead of single file was designed to increase the volume of fire forward and maximize crossfire. The purpose of the movement-and-fire tactics was to defend the advancing column, sow destruction, inflict heavy losses on the enemy, and--most important--to undermine the enemy's confidence in his ability to resist. The armored columns were to move directly to key objectives such as the main government buildings, the broadcasting stations, high buildings that dominate their surroundings, and to the major intersections that control traffic routes within the city. Once these intersections were secured, armored columns were to roam about the streets, continuing to spread destruction and shock. These columns were then to fan out into neighborhoods or blocks of buildings where pockets of resistance had been pinpointed. These would be rooted out and mopped up by infantry in house-to-house fighting.

Concept of Operations--Defense

The defender of a built-up area has major inherent advantages over his enemy, since the urban terrain is a potent weapon at his disposal. It is not clear if the Egyptian Army had a general doctrinal concept for the defense of urban areas. However, city defense is not unlike point defense of other targets except in the magnitude of the planning task.

Implicit in the tactical plan developed by the Egyptian general responsible for the defense of Suez, 'Abd al'Aziz Qabil, are several operational concepts that may be inferred.

- The offense would be handicapped by having to initiate action and capture the city. A stalemate, therefore, would favor the defense.
- The IDF was known to place great value on avoiding casualties. Therefore, the defense sought to maximize casualties irrespective of its own losses.
- The buildings within the city represent a defense asset more valuable, in terms of exacting a high cost from the attacker, than its perimeter. Thus, the attacker might be forced to absorb more losses if he is allowed to penetrate the city.
- Armor was believed by the Egyptian commander to be of little value inside a city. Consequently, the armor-heavy and armor-led IDF would be at a disadvantage once inside the city.
- Irregular forces and civilians could perform their duties effectively, it was thought, if they recognized the vulnerability of the enemy, were assigned specific, limited missions and activities, and were trained repetitiously to carry out those missions.
- General Qabil felt that the natural defensive advantages of a city could be enhanced if a few engineering changes were effected should combat appear imminent or somewhat likely.

Tactical Plan

Offense

In accordance with the Israeli concept of offensive operations in built-up areas, the city was to be cut off from all directions. Thus, one brigade which had already reached the Gulf of Suez south of the city was ordered to move northeast in an arc around it. In fact, Adan's order to encircle Suez City was given prior to IDF Southern Command Headquarters' order to capture the city.

The plan for the capture of Suez envisaged a long and heavy air bombardment complemented by an artillery barrage. Under cover of these preparatory fires, most elements of two "brigades" were to take positions to attack the city. The first of these brigades was the same one that had

already reached the Gulf south of the city, the 460th Armored Brigade under the command of Col. Gabi Amir. It was to move eastward along the Zaytiyyat Road to the oil port. Meanwhile, the 217th Armored Brigade, under covering fire of two of its armored battalions, was to enter the city itself along Route 33, the Cairo-Suez Road ("Sarag" to the IDF), and to capture the junction of Route 33 and the Maghrebi ("western") Canal, the Arba' in mosque junction, and the intersection of Route 33 and the causeway to Port Ibrahim. At the same time, the 460th would move along the Zaytiyyat Road from the oil port about 1,500 meters to the junction of another major road.

Defense

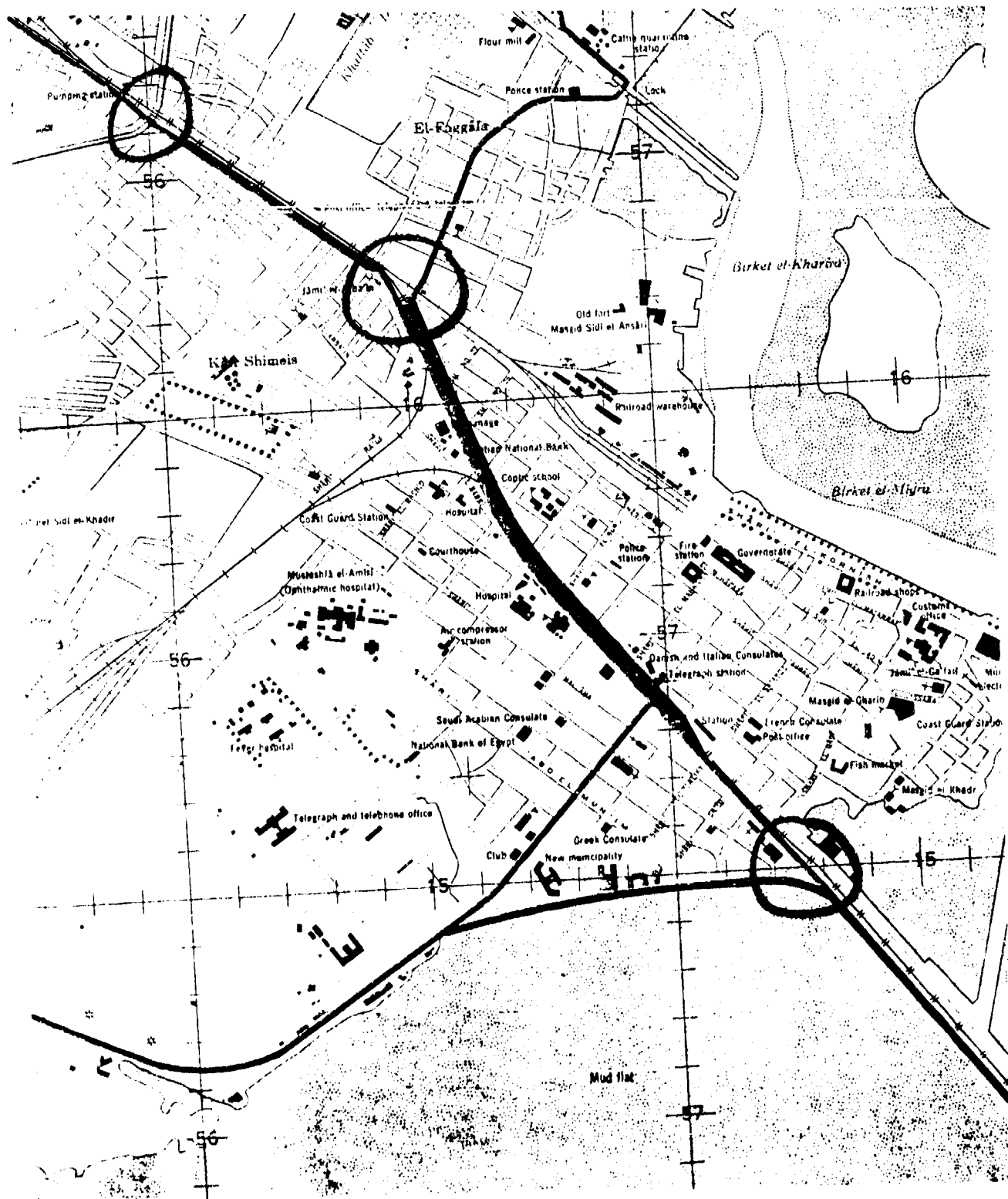
Egypt had begun to plan for the defense of Suez at least a year before the war. Defense of Suez City was grounded heavily on its residents and was therefore placed largely in the hands of retired officers who commanded civilian militias. These militias were trained regularly and each member knew his position in the event of hostilities. The governor of Suez City was a retired officer. A parallel military-civil government had been established. In the event of war the military governor had complete authority over all military, civilian, and civil government assets.

About a month before the war began, the city was prepared for defense by military engineers. This action included the blocking of minor routes into the city with mines and rubble. Major roads required for normal use were prepared for demolition but left intact. Artillery teams and observers were assigned positions in tall buildings. Command posts and supply points for critical items were located in bank vaults where they would be virtually guaranteed physical safety. Supply points for food and other materials were designated in stores and warehouses. Communications for both the military and civilian governments were centralized.

The plan for defense of the city envisaged four stages. The first was a series of trenches around the perimeter of the city. The second line was an area defense inside the city and stretched around the entire city. The third phase was a point defense of strategic targets such as the water plant, power plant, and the broadcasting station. Finally, there was a "general reserve" consisting of (a) a militia for each sector commanded by a retired army officer, and (b) a ready reserve for the city at large under the command of the military governor.

The Egyptians prepared "kill zones" on the principal streets inside the city. Clear fields of fire were established by demolition of buildings and other structures. The defending forces had no organic artillery support, but an artillery defense plan was prepared in order to draw on artillery support from the east bank of the Suez Canal.

The Egyptians did not consider tanks useful for operations inside the city because of the limited lines-of-sight and fields of fire. Two tank battalions were positioned near the bridge over the Suez Canal to defend the bridge and provide overwatching fire to the northeast of Suez along the Ismailia Road, but a small number of tanks were also employed in the outskirts of the city and between buildings at the entrance to its central area. Sagger and RPG teams were positioned along the main streets.



Map 2. Suez City: Three Israeli Objectives

The Egyptian military governor decided that the most effective defense would be to draw the Israelis into the kill zones before engaging them. Heavy use was made of ambushes. The success of these ambushes rested on the critical questions of fire control and discipline. Great stress was placed on firing only at the last minute in order not to reveal the fire plan to the IDF reconnaissance units.

Air defense of Suez City depended on the west bank-based Egyptian Air Force for air-to-air and on ground-based support from the east bank as well as some limited AAA available in the city itself.

Logistics support and C³ were maintained through the use of young people as couriers. Even some swimming across the canal to the Third Army were employed. Communications were also maintained by commo-telephone.

Operations

Encircling the city from all directions but the north was relatively easy. North of Suez, however, in an area of relatively dense and at times marshy vegetation, the single brigade charged with "mopping up" the enemy encountered substantial resistance--numerous mines and ambushes.

Because the morning of the 24th was misty, the Israel Air Force (IAF) aerial bombardment was less massive than planned. It did not get underway until about a half-hour before the planes were ordered to pull away due to the imminent arrival of the UN observers. In all, about 10-20 sorties were flown. The IAF dropped one-ton bombs at several locations within the city, creating considerable damage. Similarly, artillery support was less intensive and extended than originally planned.

Meanwhile, the 217th Armored, commanded by Col. Aryeh Karen, moved southward from its position north of the city to its outskirts encountering Sagger ambushes and, at the intersection of Routes 41 and 33, fire from tank and antitank guns. The 217th stopped in this sector to await the arrival of infantry (including paratroop) battalions due from the north.

Col. Amir's 460th Armored then began its assault along the Zaytiyyat Road. The brigade's artillery support was counter-productive in the oil refinery and storage area, because it resulted in dense smoke that obscured offensive operations and intense heat as well. Consequently, Amir called off the artillery. After clearing some buildings, the lead battalion moved to the oil port and, establishing itself on the breakwater, directed fire against the causeway leading to Port Ibrahim and against the port itself. The second and third battalions (the latter being armored infantry) proceeded through the industrial zone, including its residential sector, and took up their position at the sector boundary, the intersection of a north-south road and the Zaytiyyat Road. Two other battalions remained west of the FEBA to secure the rear and provide cover.

For almost two hours, until about 10 AM, the 217th Armored Brigade had been tied down by tank and AT fire from buildings at the city's outskirts along the main Cairo-Suez road while waiting to receive and integrate

infantry units. Because the infantry personnel had never fought together nor with armor, and because of problems in organizing the disparate elements under fire, the brigade commander did not alternate armor and infantry for the attack. Instead, the column consisted of a lead armored battalion (organized as follows: eight tanks, followed by seven Zeldas, followed in turn by about seven more tanks, followed by eight half-tracks, with about six additional tanks at the rear); a paratroop battalion of not more than 160 men in nine Topaz light APCs and three buses; a second paratroop battalion (80 men) in two half-tracks and three trucks; and finally, the brigade scout company mounted on seven Zeldas.

As the column moved deeper into the built-up area, the surrounding buildings increased in height to about six or seven stories. The low concrete wall on either side of the railroad made it impossible to move from one street lane to another. The effect was to create a much narrower penetration axis than was originally anticipated. The column advanced at a fairly high speed, firing in all directions. The entire column was extended over about 2.5 km. However, the speed at which the lead armor battalion advanced resulted in gaps developing between the lead battalion and the paratroop battalion, on the one hand, and between the latter and the smaller paratroop battalion, on the other. When lead elements reached the Arba' in Junction, one of the key positions it was to secure, but also an Egyptian killing zone, they encountered intense fire from ZU-23s, AT missiles, grenades thrown by hand from apartment balconies, and automatic weapons.

The result of the surprise at Arba' in Junction was disastrous for the attacking IDF. Virtually all the tank commanders in the lead battalion were wounded or killed, with only four remaining officers able to carry out their functions. Some of the tanks and APCs were unable to move, effectively blocking the road for others. Command and control were destroyed as a result of the simultaneous loss of almost all tank commanders, widespread injury to communications personnel, and the overloading of all tactical radio nets with appeals for assistance. Tanks and APCs veered into side streets in which many were trapped and could not escape.

The battalion commander finally succeeded in pulling together the remnants of his unit. Battalion survivors advanced quickly--still firing in all directions--to the final objective, the junction of Route 33 and the Port Ibrahim causeway. They began to regroup at the point.

Meanwhile, however, the paratroop battalion that was the second of the three elements in the IDF columns had already fallen behind the armored battalion by about 500 meters when the latter was caught in the Arba' in Junction KZ. When the lead battalion was fired upon, the paratroopers, following their own doctrine, dismounted. The brigade's deputy commander succeeded in persuading the battalion to mount their vehicles once again, but the separation of the column's two lead units was never overcome. This second battalion proceeded to Arba' in Junction where, like its predecessor, it encountered withering fire. Again, the battalion commander ordered his troops to dismount and to secure positions in the structures of the vicinity.

The third element of the column, the small reserve paratroop "battalion" under Lieutenant Colonel Yaacov Chisdai, had fallen well behind the second element. Chisdai's force dismounted its half-tracks and trucks even earlier than the second battalion of the column, and although the troops reboarded the vehicles briefly, they dismounted definitively and, in fact, abandoned their conveyances when the other paratroop battalion came under fire. Chisdai ordered his men to move forward on foot, but they came under intense fire as they crossed the Maghrebi Canal (a branch of the Suez sweet-water canal). At that point they stopped and took positions in the nearby buildings.

The final group of the column, the brigade scout company which was just entering the built-up area when Chisdai's troops were attacked, also came under fire. With heavy casualties, the company withdrew outside the city.

Thus by 11 AM, the 460th Armored Brigade had achieved its objective, while the 217th was scattered along numerous points of Route 33 in the city, was under intense fire and in most cases cut off. Elements were at the three objectives, but were as much captive as they were captor.

General Adan requested and was provided air support, but the strikes were aimed only at Port Ibrahim, because the precise location of elements of the 217th Armored was unknown. Adan directed the 460th Brigade Armored Battalion that had established itself at the sector boundary to move forward to the triangular junction of Routes 33 and the causeway to Port Ibrahim where they would meet the main surviving element of the 217th Battalion. This movement was accomplished, following which casualties were evacuated along the Zaytiyyat Road. Then, the 460th Armored's infantry battalion was also sent to the triangular junction and placed under the command of the 217th Brigade commander, Col. Karen. Karen attempted to extract some of his pinned-down elements by sending in another armored battalion that had been assigned to provide cover for the advance along Route 33. However, that battalion also encountered intense AT fires and withdrew.

At each intersection the Israelis seized and cleared various buildings, only to find other buildings occupied. In some sectors, Egyptians moved from rooftop to rooftop. The vehicles and armor of the pinned-down Israelis were slowly destroyed with Saggars, Hosam grenades, and Molotov cocktails. Tanks abandoned on side streets were disabled by Egyptians who broke the tracks or used grenades. Rubber tires on APCs were deflated.

The battle stagnated for several hours as Israeli commanders tried to come up with a solution to the problem of extricating their troops. During this period, and for the next 24 hours, Egyptians in the city made the battle a popular war by participating in many activities--carrying food to combatants, making Molotov cocktails, setting up barriers and strongpoints. Barricades were constructed with rubble, tank tracks, and stones. Engineers blocked major roads, but the citizenry participated in barricading secondary thoroughfares. Young people carried ammunition.

Adan then detached a mechanized reconnaissance battalion and a tank company from his 600th Armored Brigade operating north of the city and placed them under the command of Col. Karen. They entered on a new axis, south along Route 41, but after failing to find the forces they were sent to extricate (those near the Arba' in Junction) they retreated northwestward and noted Lt. Col. Chisdai's paratroopers. Using APCs, the mech recon battalion succeeded at 1600 in evacuating Chisdai's wounded.

At dusk, all IDF forces at the triangular junction left the city on the Zaytiyyat Road. Thus, both paratroop battalions were left trapped in the city. The initial group, tied down just south of the Arba' in Junction, suffered from loss of the battalion commander who was wounded and only intermittently conscious. About midnight, they were ordered to evacuate along a street north of but parallel to Route 33. Unseen, they were never fired on by the Egyptians, and reached IDF lines at about 5 AM on October 25th. The smaller group under Lt. Col. Chisdai escaped earlier in the night, because they had been only 2 km from IDF lines at the outset. Their evacuation was coordinated with artillery cover and skyward-pointing spotlights on IDF tanks.

Outcome

The outcome of the Battle of Suez City left the IDF in control of the outskirts of the city to the west and south, Egypt holding the central city area, and the IDF holding the ports, industrial area, and the oil installations. Route 33 was the dividing line used by UNTSO observers.

Both countries generally perceive of the Suez City battle as having been an Egyptian victory and an Israeli defeat in spite of the IDF encirclement of the Egyptian Army, completed after the ceasefire was to have taken effect. Israeli casualties were very high (estimates for casualties vary from 100 to over 400), and a substantial amount of armor was destroyed in the October 24 battle and in probing maneuvers by the IDF on the following day.

Findings

This section reviews some of the more important findings on the battle in Suez City. That the battle was fought as part of a full-scale war between well-armed adversaries makes the Suez experience particularly valuable. Although the defenders were cut off in large measure from reinforcements, one side is generally isolated in urban warfare. Indeed, the unusual aspect of the battle may well be the manpower and weapons constraints on attacking forces, not defending forces. The nature of the Israeli effort, a last-minute seizure of as much territory as possible, is perhaps more important in affecting behavior in anomalous ways. Other idiosyncracies of the battle--superterranean movement, for example--are neither particularly uncommon nor important in the battle outcome.

Weapons

Attackers found the armored personnel carrier to be a singularly useful vehicle in the city environment. Defenders were less impressed with the APC, but several commented on the firepower Israeli Zeldas delivered. The Zelda is an M-113 modified to mount three or more .50-caliber machine-guns in addition to its standard defenses. The Zeldas' capability to deliver large volumes of fire upward and in all directions induced the kind of fear IDF commanders sought to create.

By contrast, tanks received more condemnation from the Egyptians. Military personnel did not feel the tank was appropriate to the urban environment. Defenders did, however, employ tanks in the city outskirts in an ambush setting. The tanks hid behind buildings, emerged, fired, and returned to the protection of the buildings. Although General Adan is aware of the criticism that has been levelled at the use of tanks on urbanized terrain, he still feels the tank has a positive and valuable role to play. Adan's contention, however, is that the lack of infantry to secure what armor captures and dominates is of central importance. That the armored battalion of his 217th Brigade arrived at its objective demonstrates, in his view, the viability of armor as an offensive weapon in cities.

The ZU-23, used by Egyptian forces in a direct-fire role against armored columns, proved frightening and effective. Its high volume of explosive power created shock among IDF armor personnel akin to the shock Israeli BUZZ tactics were designed to create.

Similarly, the Sagger, RPG, and other AT weapons proved devastating in the urban environment where tanks found evasive movement and quick reaction difficult.

Simple hand-held weapons such as the Hosam grenade and Molotov cocktails also had a devastating effect once armor had been slowed or stopped. In this respect, obstacles became virtually another weapon system.

Air strikes did a great deal of damage to Suez, but were of little tactical value. Once the forces were engaged, IDF tactical commanders were afraid to call in CAS. Artillery also had some effect on structures but appeared to be of relatively little direct, tactical value. Israeli artillery bombardment designed to soften up specific areas does seem to have succeeded, but neither air nor artillery bombardment could prevent the use of rubble, structures, and urban clutter.

Tactics

Israeli tactics during the Suez City battle have been widely criticized, but are defended by General Adan, the division commander responsible for Israeli operations in that theatre. He believes both the general principles propounded at that time by the IDF armored corps for city fighting and the BUZZ concept to be well grounded in the realities of Middle East warfare. The IDF armored offensive concept for Suez assumes

movement-oriented, psychologically intimidating, and highly integrated action on the part of armor, and rests also on the lack of organized resistance by those in the urban area. In Suez, however, a concerted resistance was augmented by a defensive plan that added the natural defensive advantage inherent in the cityscape to the limited weapons resources available to the Egyptians. The lack of infantry accompanying armor precluded Israeli control of buildings, since Egyptian fighters moved into buildings as soon as they were cleared.

Defensive tactics were incontrovertibly effective. The importance of advance planning exceeded the tangible payoffs--complicating IDF movement, confusing C³, and exacting a high toll in lives and equipment--because planning helped bring about the failure of the BUZZ concept. Excellent control was a critical factor in the element of surprise. The defensive tactics were particularly appropriate to a situation in which attacking manpower is tightly constrained. Under these circumstances, clearing and securing buildings require more personnel than are available in densely built-up areas.

Command, Control and Communications

Command and control of engaged forces was decentralized on both sides. The Egyptian fighters in Suez fought as urban guerrillas. Although telephone and other communications remained available in some measure to defending forces, individuals and groups often acted on their own. Overall control was vested in the military governor, but during the attack this control gave way to unconventional operations largely outside any central command authority. Control in ambush operations was exercised by rehearsal and training on fire control.

Communications was not a major problem for the defenders who realized they would be operating in an unconventional manner before the battle began. Several types of radios were used, and telephone lines were available throughout the battle. Indeed, the IDF used the telephone to contact municipal leadership at the outset of the fighting.

Command and control were more clear cut on the part of attacking forces, but, following IDF practice, were also relatively decentralized. Local commanders had substantial authority to act in accordance with conditions on the battlefield as they saw them. Thus, Col. Aryeh Karen, commander of the 217th Armored Battalion, recognizing the necessity to carry out the attack on Suez expeditiously, chose to organize the components of the attacking column in contravention of IDF MOUT doctrines.

Despite the relatively free rein given local command authority, linkages were formal and closely adhered to. When additional units were brought in to assist the beleaguered 217th, for example, each was formally attached to the 217th and clearly subordinate to its commander. Overall, battle command responsibility lay with General Adan at all times, though his superior, General Gonen, was in direct communication with a young lieutenant (de facto CO of a paratroop battalion) to facilitate withdrawal at one point.

Because the IDF attack was inside Egyptian territory, land lines were not used. Instead, communications depended upon multi-channel radio. The linkup to IDF headquarters went via multi-channel to the nearest echelon with a telephone link. Tactical nets also used wireless systems. Requests for air support were radioed via territorial commands and GHQ to the IAF which is a separate command.

Innovations

While not necessarily developed for MOUT application, the Hosam grenade and the Zelda modifications were appropriate and important to the fighting in Suez.

The Hosam grenade adheres to metal, permitting Egyptians to drop it from balconies or run up to APCs and tanks and place it on the vehicle. It is a shaped charge grenade, and contributed significantly to the helplessness of IDF armored and paratroop units trapped in the city.

The Zelda is a U.S.-manufactured M113 armored personnel carrier modified to mount at least three additional machineguns, usually .50-calibres. The additional firepower gives the APC the ability to bring higher floors under fire as well as to deliver overwhelming quantities of fire in every direction. Although Israeli Zeldas were successfully ambushed in Suez, the IDF commander believes the APC is still the best single system for city fighting. Moreover, the armored battalion that did not dismount, the initial element, was able to recover and move forward through the city to the objective.

THE BATTLE OF JERUSALEM

Significance of the Battle

The fate of Jerusalem in 1967 had, and continues to this day to have, emotional and symbolic importance out of all proportion to its military significance. However, in the context of the June 1967 War the city did have a strategic role apart from the fact that the Arab-held sector included the part most sacred to Jews--the Old City and the Western Wall of the ancient temple compound to which Jews had turned their faces in prayer for two millennia. Israeli-held New Jerusalem formed the tip of a narrow salient defined by the ceasefire armistice lines of 1948 and 1949 and which connected New Jerusalem to the coastal plain. This salient, with Jerusalem at its tip, thrust deeply into the Jordanian-held bulge on the west bank of the Jordan River. Arab forces had severed this corridor during the first Arab-Israeli war (1948-1949) and the city had nearly been starved into submission before the month-long siege was broken. Thus, Israel's capital was surrounded on three sides by Jordanian military positions which took advantage of the heights of the Judean Hills to the north, east, and south of the divided city. Therefore, it was to Israel's advantage to widen that salient at the first opportunity. For the Jordanians, retention of this high ground provided a highly favorable position from which offensive operations could be launched to sever New Jerusalem's land communications from the rest of Israel.

Politically, Arab Jerusalem was important to Israel because its seizure would reinforce the legitimacy of Israel's claim to Jerusalem as its capital. For Jordan and other Arab states the larger the area of the old Palestine mandate held by the Arabs, the stronger the claim of the Palestinian Arabs to a state of their own and to the illegitimacy of Israel's existence. In addition, the Old City included the Haram ash-Sharif, making Jerusalem the holiest city in Islam after Mecca. Its loss would be a serious political blow to the Jordanian monarchy as protector of these holy places. Furthermore, the loss of Jerusalem and its vicinity would deprive the Jordanian government of an important source of revenue.

Description of the City⁷

The Old City of Jerusalem is characterized by an almost infinite number of lanes and narrow, labyrinthine streets, tunnels, intersecting roofs and buttressed houses. There are cul-de-sacs and half-forgotten vaults and caves supporting the visible urban terrain. One effect is that rooms sink beneath the street like cellars at one end, open out upon roofs at the other end. Such terrain, if vigorously defended, would provide cover and confusion sufficient to hold off a division-sized enemy force for days if need be. Outside the walled Old City, however, lies a modern urban

⁷ This section borrows heavily from Richard Ellefsen, Bruce Coffland, and Gary Orr, *Urban Building Characteristics: Setting and Structure of Building Types in Selected World Cities* (Dahlgren, VA: Naval Surface Weapons Center, 1977).

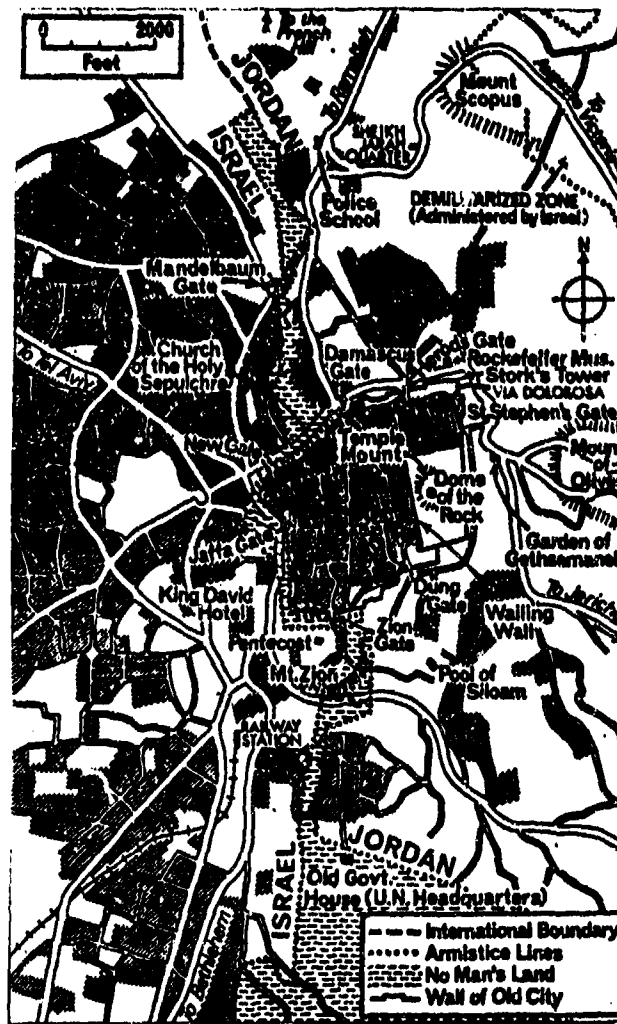
complex differing very little in either form or function from any major city. Modern development outside the wall had a very modest beginning only in the latter part of the nineteenth century, its scope and pace increasing only after British forces captured the city from the Turks in 1917.

The Old City was established on high ground atop a plateau which falls away precipitously on three sides to valleys below. Thick, stone walls at the edge of the plateau improved the site's defensibility. The modern city (both East and West Jerusalem) has a more varied terrain composed of valleys and ridges.

A distinguishing characteristic of the city as a whole is the widespread use of stone as a building material. Stone is used exclusively in the Old City and for some developments outside the city walls, particularly in the Jordanian-held sector of East Jerusalem. Within the class of stone buildings, most of the Old City consists of one- and two-story structures. These are primarily residential and in settings of narrow lanes and streets, some only 5 meters wide. Average line-of-sight is 7 to 15 meters. The larger buildings--commercial and institutional structures--are nearby and in similar densely-packed concentrations. These buildings vary in height from two to five stories with lines-of-sight ranging from 7 to 50 meters. While the low buildings have flat roofs, the taller buildings often have pitched roofs made of red tile. Major religious structures in East Jerusalem--Christian, Jewish, and Muslim--stand among these buildings. The largest, the Dome of the Rock, is located in the middle of the 35-acre Haram ash-Sharif. The thickness of the walls varies from 67 to 75 centimeters. Its walls are composed of blocks about 50 centimeters in length. A few low (one- to two-story) brick structures are found in rural villages in and near the Jordanian sector of the city. Lines-of-site in East Jerusalem are reduced by the very irregular patterns of the main thoroughfares.

An additional feature of the city was the contrasting approaches the Israelis and Jordanians used to defend their respective sectors. The Jordanians laced their border in Jerusalem with bunkers and trenches. The Israelis put up housing projects, known as shikunim. These buildings were designed like fortresses. The apartment buildings along the border had walls three times the normal thickness and firing slits and other positions for weapons on all roofs. Windows in the front of buildings facing the no-man's land were built high in the wall to make it more difficult for residents to become targets for Jordanian snipers.

The tasks of Arab and Israeli military commanders in the Jerusalem area were complicated by the existence of two enclaves created by the freezing of the 1948 ceasefire lines. (See Map 3.) The greatest military anomaly was the Israeli enclave of Mount Scopus, the site of the original Hebrew University and of Hadassah Medical Center. At the end of the War of Independence, Jewish forces still held Mount Scopus, but the Arabs controlled the Mount of Olives and the Sheikh Jarrah residential quarter which separated Mount Scopus from Jewish Jerusalem, a kilometer and a half away. Under the armistice agreement, it was declared a demilitarized zone. Tactically, it commanded most of the Old City and the road running north to

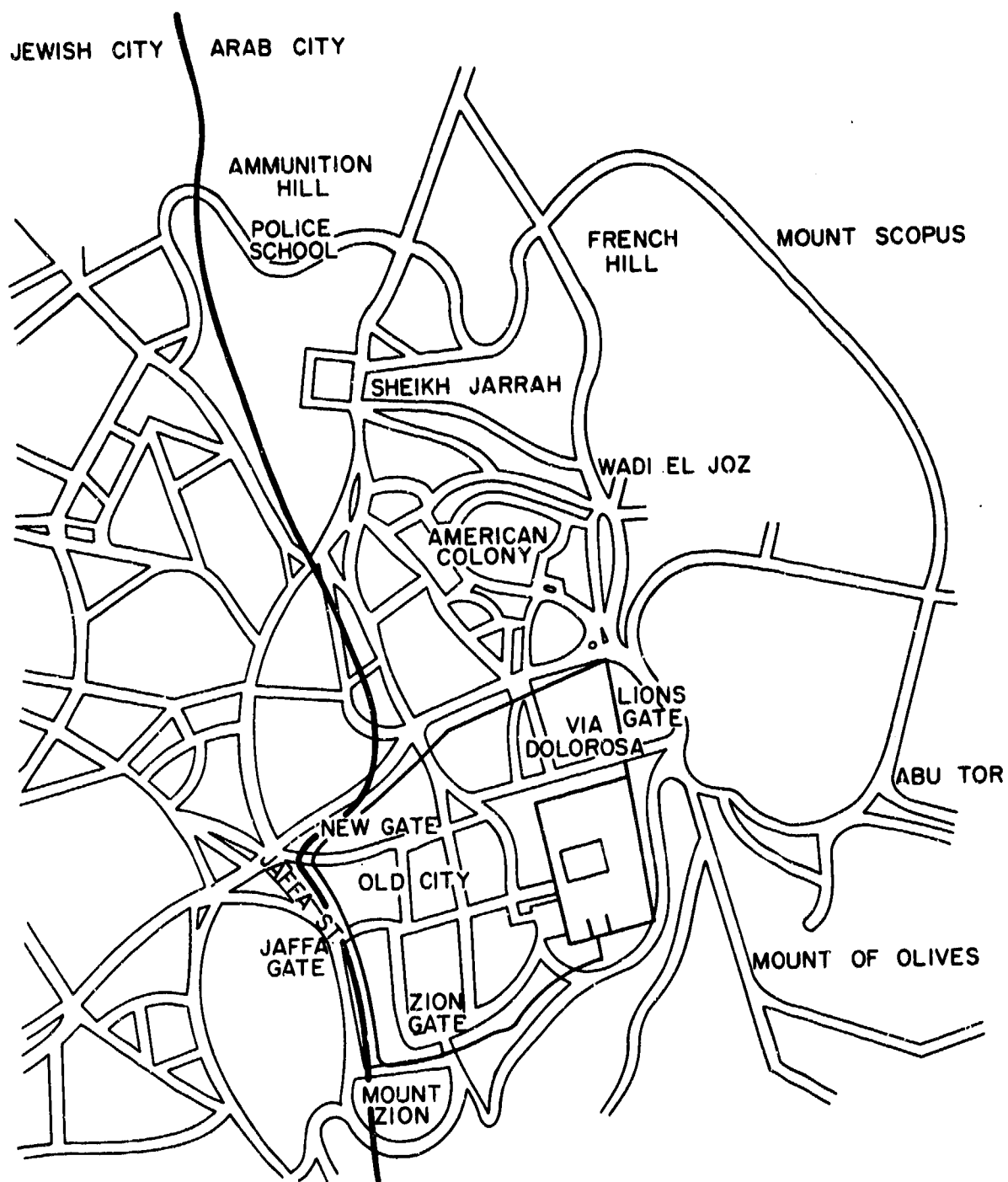


Map 3. Jerusalem. Source: Randolph S. Churchill and Winston S. Churchill, The Six Day War (London: Heinemann, 1971), p. 125. Reprinted with the permission of Curtis Brown Ltd.

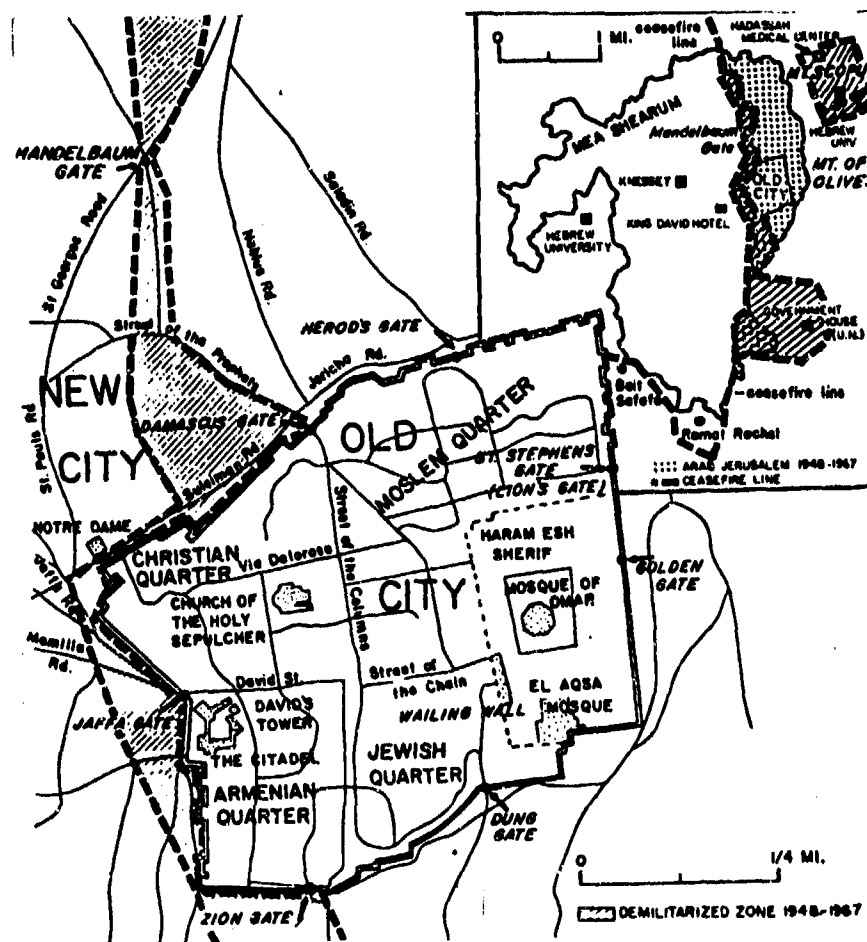
Ramallah. The other enclave was that surrounding Government House, the former residence of the British High Commissioner of Palestine, which had become the headquarters of the United Nations Truce Supervisory Organization (UNTSO) following the Arab-Israeli war in 1948 and the armistice agreement. It was located on a large demilitarized zone on a hill south of the Old City overlooking the road linking Jerusalem with Bethlehem. Located on the one piece of high ground that was not occupied by either of the opposing armies, the U.N. compound afforded a magnificent view of the Old City about 2 kilometers to the north. Geographically it was located east of the Old City on the spine of the Judean Hills and was connected to the Mount of Olives by a narrow ridge.

The two Jerusalems were divided by an armistice line and no-man's land on a north-south axis that extended for 7 kilometers. Both sides had laced the border areas with block houses, bunkers, and trenches. In the center was the anchor of the Jordanian line, the kilometer-square wall of the Old City itself. Apart from some lower courses dating from before the birth of Jesus, the wall was relatively modern by Middle East standards. The Turks had built it about 400 years before on the ruins of ancient battlements. Curiously, although European Renaissance structures of the same era were built with walls suitable for defense against cannons, Jerusalem's walls were a medieval construction that appeared oblivious to the invention of gun powder. Instead of cannon redoubts, it had firing slits for crossbows since the walls were only intended for defense against Bedouin raiders. Since the division of the city in 1949, the Jordanians had lined the ramparts facing Israeli Jerusalem with pill boxes and filled in the tall arrow slits with concrete, leaving only small firing holes. A mouth-shaped segment had been removed near the top of the wall near the Jaffa Gate to permit heavy weapons to cover the approaches to Mount Zion south of the Old City.

South of the Old City the opposing forces shared four hills; the Israelis occupying the western slopes, the Jordanians occupying the eastern. (See Maps 4 & 6.) The Israelis dominated the crest of the first two hills, Mount Zion and Abu-Tur. The top of the third hill, Jebel Muqaiba, belonged to neither side. This was the Government House enclave described earlier. Affording the clearest view of the Old City 2 kilometers away, it served as UNTSO headquarters in the Middle East. A large segment of Jordanian and Israeli territory on the hill surrounding the U.N. compound had been demilitarized. Jebel Muqaiba was the only strategic location in the entire Jerusalem area where neither side had a substantial military presence. The fourth hilltop to the south of the Old City was shared by the Arab village of Sur Bahar and the Israeli kibbutz Ramat Rachel. This position was particularly important since it overlooked the main road connecting Arab Jerusalem with Jericho to the south. It was along this road that reinforcements from Jericho would have to travel in order to relieve Arab Jerusalem's defenders.



Map 4. Jewish and Arab Jerusalem



Map 5. Jerusalem: The Old City. Source: Trevor N. Dupuy, Elusive Victory: The Arab-Israeli Wars, 1947-1974 (New York: Harper and Row, 1978), p. 289. Reprinted with the permission of Col. Dupuy.

The Combatants

This section describes the forces both Israel and Jordan used in the fighting in Jerusalem and its immediate environs only. These assets include personnel, equipment, and dedicated support resources.

Israel

The IDF ground forces committed to the battle of Jerusalem proper were part of a division-size force commanded by Brigadier General Uzi Narkiss. The largest formation was the "J" Brigade (referred to in some reports as the "Jerusalem" Brigade or the Etzioni Brigade) commanded by Colonel Eliezer Amitai. This was actually a small division comprising seven infantry battalions, one tank battalion, plus other supporting elements. One of the most significant features of this formation was the composition of its personnel. Except for a small cadre of regular officers, this brigade was composed entirely of reservists 85 percent of whom were residents of Jerusalem. Unlike most other reserve units, this brigade was assigned to a fixed area, the capital and its approaches. If war broke out these soldiers knew they could be fighting within sight of their own homes. Moreover, a large proportion of this brigade consisted of men between 35 and 45 years of age. Many of these either fought in the first battle of Jerusalem during Israel's war of independence or had lived in or frequented what later became Arab Jerusalem. Thus, many of the personnel in this brigade had a first-hand familiarity with the enemy-held urban terrain.

The second principal formation was the "H" (Harel) Armored Brigade commanded by Colonel Uri Ben Ari. It consisted of three battalions: one tank battalion and two battalions of half-track-borne infantry. This was a regular army formation.

The third main formation was the "Q" Paratroop Brigade commanded by Colonel Mordechai Gur. It comprised the 6th, 7th, and 8th Battalions. It was Gur's brigade that bore the brunt of the fighting in the built-up areas of Jerusalem. Each of these battalions differed markedly from the other two.

The 6th Battalion, commanded by Lieutenant Colonel Joseph, had been in existence for about 3 years. The average age of the men was 24, and they had worked together long enough to be welded into a tightly cohesive fighting unit. The 7th Battalion, commanded by Lieutenant Colonel Uzi, was a brand new unit formed only 3 months before the June War. The men were fresh from regular service, and their average age was 22. They were all so new that the officers did not know the names of the men. The 8th Battalion, commanded by Lieutenant Colonel Yossi, was the veteran unit in the brigade. Many of its men had been with it since it was organized in 1957. It was a very closely-knit "family unit."

Finally, the Israelis had a garrison of 120 "policemen" occupying the Mount Scopus enclave, which was a commanding height on the spine of the Judean Hills running north and south just east of the Old City.

Very little is known about the numbers of weapons used. Major equipment items were available as follows (figures approximate):

<u>Unit</u>	<u>Equipment</u>
1 armored brigade (Harel Brigade)	12 centurions 60 Shermans
"Q" Brigade; 6th, 7th, and 8th Batalions	
Etzioni Brigade	Bangalore torpedoes 81mm mortars 155mm mortars 160mm mortars Bazookas Special "new weapons" (1) an artillery shell specifically designed to destroy stone block houses that could not be seriously damaged by bazooka fire. (2) catapult devices designed to sling a heavy explosive over a short distance with measured accuracy.
1 tank battalion ⁸	32 Shermans
Reconnaissance Co.	
Engineering Co. (7th Battalion)	
	Other--half-tracks, jeeps, buses

Jordan

The Jordanian forces primarily responsible for the defense of the Old City of Jerusalem and its suburbs numbered about 5,000 men. The principal formation was the 27th (King Talal) Infantry Brigade commanded by Brigadier General Ata Ali. This brigade was made up of three infantry battalions, one artillery regiment, and a field engineers company.

⁸ The existence of this tank company was one of the most closely-guarded secrets in Jerusalem. Under the original 1949 armistice agreement, tanks were prohibited within 10 kilometers of the border and so could not be stationed in the city itself. These tanks had been kept hidden in a shed beyond the 10 kilometer limit for over a decade.

The most reliable unit of the 27th Brigade was the Second King Hussein Battalion which was recruited from East Bank Jordanian and Palestinian peasantry. This battalion held the northern half of the Jerusalem perimeter which began at the Damascus Gate in the Old City and extended along the Nablus Road to the United Nations Relief and Works Agency (UNRWA) building (the former Police Training School) and Ammunition Hill. The latter was the most strongly fortified position in the Jerusalem area.

The battalion defending the Old City proper consisted of approximately 480 reservists recruited from the West Bank. (See Maps 4 & 5.) They were fresh from the Hebron district and were unfamiliar with the Old City or its suburbs. These reservists had received 3 months of training in early spring and had been called up shortly before the war. The reserve program had been initiated only in December 1966 and had barely begun to function by June 1967. This battalion manned the walls of the Old City from the Damascus Gate to the Zion Gate. A platoon from this unit (36 men) was drawn to hold the Augusta Victoria Ridge lying between the Mount of Olives and Mount Scopus overlooking the walled city to the northeast. (See Map 4.)

The third infantry battalion consisted of 500 men and held the southern perimeter. It was positioned largely at Sur Bahar, a village that occupies the "high ground" overlooking the main road which linked the northern and southern parts of the West Bank. A company (120 men drawn from the battalion assigned to the Old City) held the upper half of the southern perimeter at the village of Abu Tur.⁹

Supporting the 27th Brigade but not under Ata Ali's command¹⁰ were elements of three other brigades, one battalion of the El-Hashim Brigade stationed about 15 miles north of Jerusalem near Ramallah, one battalion of the 60th Armored Brigade (the remainder being stationed between Jericho and Nebi Musa), and one battalion of the Hittin Infantry Brigade (headquartered in Hebron). The latter unit was eventually put under Ata Ali's command after hostilities broke out.

The Jordanian soldiers carried either the U.S. M-1 Garand or M-1 Carbine, and also had some Bren automatic rifles.

These regular forces were supplemented by small groups of armed civilians organized by a popular resistance committee. The committee with its headquarters at the Qadisieh School, in the Bad Hutta Quarter of the Old City near Herod's Gate (See Maps 4 & 5), had organized command centers in the Old City and in the immediate suburbs to deliver arms to about

⁹ Most of the Jordanian manpower figures are taken from Abdullah Schleifer, The Fall of Jerusalem (New York: Monthly Review Press, 1972), Chapter 8.

¹⁰ General Ata Ali was at a forward command post in Arab Jerusalem: a police compound north of the modern commercial district overlooking Wadi al-Juz. His staff officers, however, were at the Azzerriya Junction located several miles to the southeast of Jerusalem.

10,000 of the district's male populace. Twelve commands were organized within the Old City and five in the suburbs--al-Mustata, Zahara Quarter, Wadi Juz, Sheikh Herrah, and Abu Tur. However, it appears that arms were distributed to fewer than 500 civilians. The weapons consisted largely of Lee-Enfield rifles, Sten guns, and Bren guns.

Major equipment items that were available are listed below (figures approximate). A distinction, however, should be made between equipment and weapons available to units directly under Ata Ali's command and those not under Ata Ali's command. For example, Ata Ali had neither tanks nor armored personnel carriers at his disposal even though the 60th Armored Brigade had about 88 M-48s deployed on the Jericho plains east of Jerusalem and some of these were eventually sent to aid Ata Ali's forces.

<u>Unit</u>	<u>Equipment</u>
1 infantry brigade (27th)	1 battery of light 40mm AA guns 120mm mortars 18 25-pound field guns 160mm recoilless guns bazookas
1 tank battalion (60th Armored Brigade)	40 M-48 Pattons
1 infantry battalion (Hittin Brigade)	106mm recoilless guns bazookas .30 caliber Bren guns .30 caliber machineguns

The Situation

Israel

The strategic and emotional importance of Jerusalem notwithstanding, the decision to take the city was eventually an incremental one based on three streams of activity: (1) Israel's rapid military successes on the southern front; (2) the necessity of defending Israeli Jerusalem against the most likely targets of an Arab offensive; and (3) Jordan's active entry into the war even as Syria and Egypt were already facing certain defeat.

When hostilities first began on the morning of June 5, the IDF had taken strict precautions not to provoke Jordan's King Hussein. The chief concern was to keep the situation on the Israeli-Jordanian front as quiet as possible while the bulk of the IDF's strength was committed to the fighting with Egypt. The Israelis hoped that in the event of hostilities, King Hussein would confine himself to a brief show of force by firing artillery and small arms but taking little additional offensive action. Thus, on June 1 Israel had agreed to postpone the routine relief of the Israeli garrison on Mount Scopus, since the Jordanians said they could not

guarantee its security as it passed through their territory owing to the hostile attitude of the inhabitants. Moshe Dayan had suggested to General Narkiss that several small routine troop movements and training exercises, scheduled to take place in the Jerusalem area, should be cancelled in order to avoid appearing to offer provocation. Similarly, between June 1 and June 5, when hostilities commenced, shots from Jordanian positions were becoming an almost daily occurrence. However, Israeli troops manning the perimeter had strict orders not to return the fire. Once Israel launched its air strikes on Egyptian airfields on the morning of June 5 and ordered the IDF to begin offensive action in the Sinai, Israel made certain moves to persuade Jordan to remain neutral. Even when Jordan opened fire on Israeli positions mid-morning on June 5, there was some hesitation at Israeli headquarters as to whether the Jordanians were serious. Even after hostilities began, Chief of Staff Yitzhak Rabin refused General Narkiss' requests to occupy Latrun, Government House (UNTSO) headquarters on Jebel Muqaba, and Abdul Aziz Hill northwest of Jerusalem.

The Israeli position toward Jordan began to shift, however, as indications of the IDF's stunning success against Egypt began to pour into IDF central headquarters. Thus, the need for restraint on the Central Front (between Israel and Jordan) began to diminish just as the Jordanians commenced firing along the entire length of the border, not only at military targets, but at population centers as well.

The Israeli war plan was to hold the line opposite the Jordanian and Syrian fronts in a completely defensive posture since the bulk of the IDF would be engaged in the decisive battle with Egypt in the Sinai Peninsula. Thus, although Narkiss' mission was initially defensive, he was prepared to seize the tactical offensive in the Jerusalem area as rapidly as possible should Jordan initiate any attack beyond some face-saving gesture of hostility to show solidarity with the Arab cause.

Whether he remained on the defensive or assumed the offensive, the most serious problem confronting Narkiss was the Mount Scopus enclave. This Israeli-held enclave was cut off from Israeli Jerusalem and completely surrounded by Jordanian territory. When hostilities began on June 5, the Jerusalem Brigade was the only formation available to Narkiss for the defense of the city. While he was confident that this force could hold off any attack the Jordanians might mount in the city or in the Jerusalem corridors, he did not think that the unit could by itself break through the defenses the Jordanians built up in the city over the past 20 years to reach Mount Scopus if it were attacked. Without help, the 120-man garrison on Mount Scopus could not hold out against a determined Arab assault. If the Jordanians overran Mount Scopus, Narkiss was afraid that a U.N. ceasefire might be imposed before Israel had a chance to retake it.

Narkiss' other local concern was the status of the Government House compound. It was his responsibility to make sure this piece of high ground was not seized by the Jordanians.

A more serious threat for which Narkiss had to be prepared was the possibility that the Jordanians might encircle and cut off the Israeli part of Jerusalem. This latter contingency appeared more probable after May 24 with the arrival of a whole Iraqi infantry division supported by 150 tanks.

In the event of an Arab attack, Narkiss had been told he could not count on reinforcements. The plan he developed towards the end of May was to break through with his infantry to Mount Scopus from Jerusalem and to move his armor up to the high ground between Jerusalem and Ramallah where he would be in a position to dominate the whole of Jerusalem and defend Mount Scopus and Government House.

Narkiss believed that the fate of Jerusalem would depend on the outcome of a race between two forces, starting on opposite sides of the Judean Hills, to the heights overlooking Jerusalem. It was a race in which the odds favored the Jordanians as their Patton tanks were faster than the Israeli Shermans and were positioned closer to Jerusalem.

Having been told he could not expect reinforcements, Narkiss mobilized the civilian population to prepare the city for attack. Preparations included digging miles of trenches, filling and positioning sandbags, and laying mines. The threat of war raised the specter of 1948 when Arab forces besieged Jerusalem and nearly starved the city into submission.

The Ministry of Commerce and Industry adopted a bold plan to meet this threat in the future. Since any future war was assumed to be a short one, rationing had been dropped in 1958 and a policy of "overflow"--keeping so much food on hand that people would be permitted to buy as much as they wanted--was instituted. Staples were stored in sufficient quantities in local government warehouses to supply the population for more than half a year even if Jerusalem was completely isolated.

The water situation was also very favorable. Two mains connected the city with the national water grid, but even if these were cut, municipal officials were confident they could manage. First, large water supplies had been discovered just outside the city and this local source could supply most of the city's needs. Second, all houses in Jerusalem since ancient times had been built with underground cisterns to trap and hold the winter rains. Despite the availability of piped water, the Israelis had continued to require new houses to be built with cisterns as a reservoir against siege rather than drought. In the event that pumping stations were destroyed and it became impossible to supply piped water, the municipal water department was prepared to use 100 portable water tanks left over from the 1948 siege. They could be filled from reservoirs and cisterns and distributed to the neighborhoods on trucks.

As the crisis intensified, the water department dispatched people to knock on doors and advise householders to fill empty cisterns with piped water. No public announcement was made for fear of creating a panic. Those cisterns that were already filled had samples taken from them to be sure the water was still potable. Both the water department and the public were further prepared as a result of regular drills staged over the years. These had involved devising emergency measures on the spot to meet hypothesized problems.

The one glaring omission in the city's preparedness was adequate shelter space. In its eagerness to provide quick housing during the years of massive immigration, the Ministry of Housing had ignored a Jerusalem municipal ordinance requiring all new buildings to be built with shelters. Thus, in 1967 Israeli Jerusalem found itself with no shelters for 40 percent of its population (about 75,000 people). To redress the problem, thousands of volunteers turned out to dig trenches next to shelterless apartment blocks and schools. Inhabitants of dwellings without shelters were advised to choose the lowest room in the house and to block its windows with sandbags. An engineer was dispatched to provide direction on the spot to those residents who requested advice.

The municipality ordered a fleet of trucks to begin dumping sand from a nearby quarry onto street corners throughout the city to enable people to sandbag their homes. Burlap sacks were acquired from sugar factories and made available at nominal cost in grocery stores.

Unknown to the residents living along the city's border, plans existed to evacuate them in the event of war. An organization known as PESACH (an acronym made up of the Hebrew words for evacuation, welfare, and burial), whose existence was known only to those assigned to it, began preparing 36 schools and other public buildings as evacuation centers. These would be able to accommodate up to 20,000 people for several months. In order to avoid panic, however, no evacuation was to be initiated until war was clearly imminent. This also avoided having to care for some 20,000 people prematurely--and perhaps needlessly--turned into refugees.

Jordan

The Jordanian side of the situation differed markedly from that prevailing in Israel. The central problem confronting the Jordanian leadership--both civilian and military--was the harsh fact of lack of preparation of the city for war and the risks of arming the civilian population and enabling it to fight a truly popular resistance that was primarily Palestinian and that might turn its weapons eventually on the Hashenite "establishment" in Jerusalem. The dilemma underscores one important characteristic of military operations on urban terrain--the need to mobilize, and probably arm, the civilian population--but with the realization that an armed and disaffected population may lead to the overthrow of the incumbent government.

By the end of May, Jordan was neither prepared nor seriously preparing for war. Notwithstanding some highly visible troop movement in the Jordan Valley and royal decrees to register trained volunteers for service in the army and to arm some frontier villages, the public mood in Jerusalem displayed neither an apprehension of war nor preparations to meet it. The one exception was the municipality which made some rudimentary preparations. Mayor Rouhi al-Khatib had ended his vacation in Geneva and returned to Jerusalem on May 24 to quickly and quietly survey the city's water reserves and order an immediate boost in fuel supplies for a 5-month reserve. When the war broke out at least the pumping stations and the suburban electric station were sandbagged. Apart from these precautions,

there were none of the customary signs--sandbagging, requisitioning of houses, the rooftop emplacement of machinegun and mortar posts, stockpiling of barbed wire or other barricade materials--that would have suggested any serious plan to fight, if necessary, from within the walls of the Old City or the surrounding urban areas. The pace of the pedestrians remained as leisurely as usual. Civilian males could be seen in abundance in the streets of Jordanian Jerusalem in contrast to the Israeli side.

Over the weekend of June 3-4, Jordanian soldiers began building a 2-meter high concrete wall on the northern perimeter at the edge of the no-man's land to the right of the police training school. Another unit began digging trenches in French Hill which covered the northern approach to Mount Scopus. Along the southern perimeter at Abu Tur, Jordanian troops began digging trenches around their blockhouses. These last-minute fortification efforts, however, did not include Ata Ali's forward command post at Karm al-Alami. This was a police compound just north of the modern commercial quarter and overlooking Wadi al-Juz. There were no sandbags available there nor were any trenches dug.

The governor of Jerusalem, Anwar al-Khatib, convened an emergency meeting of civic notables, representatives of the army, police, and civil government on May 30 to discuss the establishment of popular resistance councils throughout the city and adjacent villages. The problem was that the deputy commander of the Arab Legion, Sherif bin Nasser (King Hussein's uncle), dismissed the need to arm the population of Jerusalem as unnecessary, claiming that Jordan had five brigades (about 20,000 soldiers) to defend Jerusalem. Anwar al-Khatib finally extracted a promise to provide 10,000 rifles to be distributed to the civilian population. However, these rifles did not arrive before hostilities began.

Concept of Operations--Offense

The IDF approach to fighting in built-up areas places heavy emphasis on the use of armor and mechanized infantry. IDF doctrine also stressed the advantages of beginning a battle in urban terrain at night. When attacking a city the defender is assumed to have a significant advantage. Therefore, it is more effective to cross an open area and occupy the outskirts of a city at night. Once inside the city, however, IDF doctrine held that it is more advantageous to fight during the day.

IDF doctrine also emphasized small-unit independence. In larger cities, one's forces are spread over many streets and are located in many buildings. Since it is difficult to control such forces, the course of the battle would depend on the training and willingness of individual soldiers. If individual units were expected to continue to press the attack without artillery or air support, it might be desirable to fight at night.

When fighting during the day, the IDF believed that the most effective unit to fight in a built-up area is tanks supported by small elements of engineers and infantry. This force ordinarily consisted of about 10 tanks, 2 half-tracks with engineers, and 2 half-tracks with infantry. IDF experience was that it is difficult to quickly deploy reinforcements to first line units fighting in urban terrain. This was reflected in the fact that the Israelis preferred to take reserves into the city itself with the battle units.

This main force, built on tanks, was to penetrate as deeply as possible in order to reach the main crossroads and to capture key buildings. The objective was to try to take as many roads and streets as possible since this provides more maneuver options and increases the ability to outflank obstacles when they occur. It was thought better to use the main streets, but desirable to have an alternate route planned when obstacles are encountered. The IDF recognized that it is more dangerous to use main streets. However, if these were avoided, the attacking force would not make very rapid progress with tanks. In Arab Jerusalem there were very few places where tanks could move fast. Once the main buildings were captured the IDF could bring up more engineers and infantry, supported by fewer tanks. These units could clear the most important areas leaving the rest of the city for later action.

The centrality of the tank in IDF thinking about urban combat extended to reconnaissance. Reconnaissance patrols were based on the tank and APC. The IDF viewed the use of the patrol as one of fighting reconnaissance. Isolated foot patrols in built-up areas were believed too vulnerable to be effective.

Artillery support was deemed very important at the beginning of the battle when the attacking force must cross the open areas into the built-up and defended edges of the city. Once inside, however, the IDF preferred to avoid using it very heavily since it is very difficult to coordinate artillery when there are many units on the move and contact is close. Another difficulty with artillery is that one cannot observe the hits in order to assess damage and correct fire. The attacking forces have to be stopped and observers sent to the roof of a high building in order to observe the hits. Therefore, once inside the city the IDF planned to abandon the use of direct artillery support and air power, and to use them only against remote targets.

Since the defender is hidden in buildings and IDF forces are in the open, the defender can use artillery more effectively than the attacker. Hence, the IDF preferred to press as close as possible to the enemy to prevent him from using artillery without hitting his own troops.

Concept of Operations--Defense

Apart from the inherent advantages conferred upon the defender by the very nature of urban terrain, there is no indication that the Jordanian Army had any doctrinal precepts for fighting in urban areas. Indeed, a review of the Jordanian dispositions and the lack of preparation of the city proper for war suggests that Ata Ali may have been planning a point defense of the city along its approaches from the Judean Hills, Abu Tur, and Ammunition Hill.

From the disposition of Ata Ali's forces and accounts of the fighting, some operational concepts can be inferred.

- The offense would have to sustain high casualties in order to cross the no-man's land and break through either to Mount Scopus or to the Old City.
- Buildings within the city are easier to defend with a small number of troops than fortified positions along the length of the border, exacting a high cost to the attacker in terms of casualties and slowing down his rate of advance.
- Artillery was to be used to disrupt Israeli military activities in the New City and to demoralize civilian neighborhoods. It could also be used to good effect to disrupt any Israeli attempts to cross the no-man's land.
- Armored or mechanized forces were believed to be of little value inside the city as suggested by the fact that Ata Ali had neither tanks nor APCs at his disposal.
- Ata Ali apparently did not believe that arming the civilian population would serve a useful purpose for he made no effort to mobilize the population, nor did he distribute arms to them. Efforts to secure arms and the establishment of popular defense committees were initiated by civilian leaders such as Anwar al-Khatib.

Tactical Plan

Offense (See Map 6)

In accordance with the Israeli concept of carrying the war to the enemy's territory and of offensive operations in urban terrain, the city first was to be cut off from outside assistance. While half of the Jerusalem Brigade was to hold the northern and eastern perimeters of New Jerusalem, the other half of the brigade was to seize the Abu Tur district south of the Old City, to cut communications between Jerusalem and Bethlehem, and to threaten Jordanian communications between Jerusalem and Jericho. The Harel Brigade was to seize the main ridge line north of Jerusalem between that city and Ramallah. It was then to take the high ground to the north and east in order to forestall arrival of reinforcements from either Ramallah or Jericho. The main offensive against Jordanian Jerusalem would be made by Colonel Mordechai Gur's paratroop ("Q") brigade which was to envelope the city from the north.

The plan for the capture of the city itself called for the 6th Battalion, led by Lieutenant Colonel Joseph, to launch a northern breakthrough, taking the Police Training School and Ammunition Hill, then moving to clear the Sheikh Jarrah residential quarter at the foot of Mount Scopus. The 7th Battalion under Lieutenant Colonel Uzi would break through

Defense

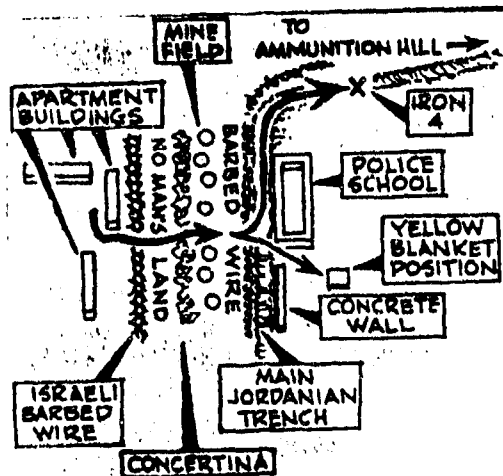
There does not appear to have been an advance plan for the defense of the city proper, beyond relying on the advantage fighting in urban terrain confers upon the defender. Instead, the original Jordanian defense plan called for three limited-offensive objectives in the event of war with Israel. The first was the seizure of Mount Scopus. A plan had been prepared to arm the population living in Isawiya, a village which is perched on the approach to Mount Scopus. The villagers were to storm the Hadassah Hospital-Hebrew University enclave on top of the hill, which tactically commanded most of the Old City and the road to Ramallah. The villagers had no military training but they were to be given artillery support. Two other local objectives were the taking of the former Government House (UNTSO headquarters) on Jebel Muqabe and the Israel kibbutz of Ramat Rachel south of the Old City. Additional objectives called for the taking of Bir Main and Kibbutz Shalavim in the Latrun area and the northern part of the Gelboa Hill feature in the north near Jenin. The latter two objectives, as well as the encirclement and strangulation of New Jerusalem, were not realistic unless they were part of a combined Arab operation in which the Syrian, Iraqi, and Saudi armies played very large roles.

Operations (See Map 6)

The first sustained firing in the Jerusalem district began at 11:15 a.m., June 5, when Israeli artillery and small arms fire opened up against the Jordanian positions. The initial operations on both sides--i.e., the Harel Brigade's northern thrust to seize the high ground between Jerusalem and Ramallah and the Jordanian seizure of Government House and the Israeli counterattack and eventual capture of Government House--did not involve military operations in built-up areas per se. With the coming of darkness the Jordanians began concentrating heavy artillery fire on the Mandelbaum Gate crossing, the only direct road connection between the two halves of the city. Their evident concern that an attack might be launched from this direction was warranted for the paratroopers had contemplated such an attack.

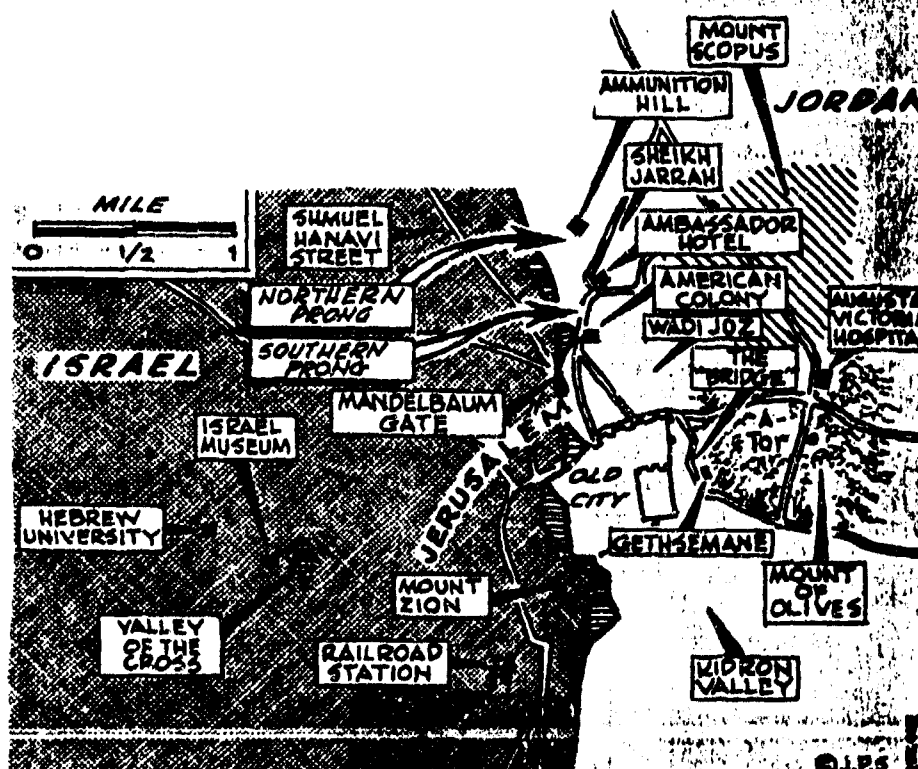
Apart from fairly continuous artillery and small arms firing from both sides, the battle for the city of Jerusalem did not begin until 11:00 p.m. on June 5 when Israeli artillery and mortars began to hammer Jordanian positions north of New Jerusalem and between Arab Jerusalem and the Mount Scopus enclave. Particular attention was paid to the vicinity of the Police School and Ammunition Hill. To facilitate these mortar and artillery concentrations, searchlights from Israeli Jerusalem and the Mount Scopus enclave focused their beams on targets in Jordanian Jerusalem.

Colonel Gur's attack began at 2:20 a.m. Shortly before that Israeli searchlights focused on empty spots on the terrain in Jordanian territory and remained fixed there for minutes at a time. They were marking hovering points for helicopters to land troops on the slope above Wadi al-Juz. This was an attempt to outflank the frontier positions along the Nablus Road, the Police Training School (the UNRWA building), and Ammunition Hill. At least 40 paratroopers were landed in four separate drops behind enemy lines.



Israeli Paratroops break through no-man's land. Reprinted through the courtesy of The Jewish Publication Society of America, copyright holder.

Paratroop Attack



Map 7. Israeli Paratroop Attack on East Jerusalem. Reported through the courtesy of The Jewish Publication Society of America.

Ata Ali ordered a platoon off Ammunition Hill and into a wooded area, northwest of the British Military Cemetery on Mount Scopus, to stop the advancing Israeli paratroopers. A group of armed civilians operating in loose coordination with the Second Battalion (holding the threatened northern perimeter) was sent to Wadi al-Juz to attack the paratroopers' flank.

At 2:20 a.m. the main body of Gur's paratroopers moved out through the demilitarized zone into the area between the Mandelbaum Gate and the Police School leading into the American Colony area following an intense artillery preparation. The 6th and 7th Battalions were in columns of companies. The 6th Battalion pushed toward the Police School and Ammunition Hill. The 7th Battalion fought its way through Sheikh Jarrah and the American Colony to the Rockefeller Museum. The 8th Battalion remained near the Mandelbaum Gate and did not cross the Armistice Line until dawn.

The Jordanian defenses consisted of concrete and stone bunkers and emplacements, usually connected by a trench system. They were located slightly east of the Armistice Line, behind which were located a number of strong positions. In front of the first line of defenses was a stretch of open land, varying in width from just a few meters to up to 300 meters, which was liberally laced with mines and on which were erected barbed wire fences and obstacles. First, the Shermans moved forward to be in position to give covering fire to the assaulting infantry. However, the noise of their engines and tracks was heard by the Jordanians, who opened fire with all the weapons they had along the entire length of the front. Thus, the Israelis took casualties even before they made contact with the enemy.

Large quantities of bangalore torpedoes and explosive charges were used in crossing the open ground, but the IDF nevertheless suffered many casualties in breaching this outer belt of mines and five barbed-wire fences. Once they had reached the emplacements, they found themselves engaged in intense hand-to-hand fighting in trenches and bunkers, which in many instances lasted until 7:00 a.m. This was followed by house-to-house fighting during which the Israelis had to deal with snipers, grenades, and booby-traps as retreating Jordanian troops fought back from buildings in which they had taken temporary refuge. Several houses had to be cleared more than once.

The 6th (northernmost) Battalion split into four separate company columns. Two of them made a pincer movement on to Ammunition Hill, located northeast of the Police Training School. This was the strongest of all the Jordanian defensive positions. It was defended by 200 Jordanians, and the battle over this position lasted 5 hours. The battle for Ammunition Hill was generally acknowledged by both sides to be the fiercest engagement in the entire war. The Israelis eventually emerged victorious, but at a cost of over 50 killed and three times that many wounded. At least 106 Jordanians died, and practically all the other defenders were wounded.



Map 8. Diagram of Ammunition Hill defenses and IDF attack. Reprinted through the courtesy of the Jewish Publication Society of America, copyright holder.

The third company of the 6th Battalion drove straight for the Police Training School. It was assisted by the paratrooper platoon that had been landed by helicopter and had broken out of ambush. The School is a large fortress-type building of concrete, which together with the Mandelbaum Gate, dominated the Sheikh Jarrah district. By 3:45 a.m. the Israeli forces had taken the Police School. They then became involved in house-to-house fighting in the Sheikh Jarrah district where they assisted the fourth company column, which had been fighting this built-up area from the start. The 7th Battalion crossed the border just north of the Mandelbaum Gate in two columns and forced its way through the American Colony district to the Rockefeller Museum which overlooks the northeast portion of the Old City wall including Herod's Gate. The American Colony is an area full of two- and three-story buildings mostly of stone construction with pitched tile roofs.

From 2:20 a.m. until about 4:15 a.m. when dawn broke, the paratroopers fought largely on their own with infantry weapons, forcing their way through fence after fence of barbed wire obstacles. Artillery support was impossible in the darkness and confusion. However, some supporting fire by 120mm mortars and by artillery directed from Mount Castai (General Narkiss' headquarters) was put down on Jordanian positions in response to radio requests from soldiers actually doing the fighting. The use of artillery was possible in this instance, even in the dark, because every single building was well known to the Israelis and had been carefully plotted. Therefore, this fire had some value in harassing the Jordanians beyond the front and in interdicting supplies and reinforcements. Two searchlights mounted on the tall Histadrut Building in Israeli Jerusalem were used in three instances to direct interdiction air strikes. The Jordanians tried hard but unsuccessfully to extinguish those lights with gunfire.

When daylight came the Shermans advanced closer to where the paratroops were fighting to bring their guns into action at pointblank range to blast buildings that contained defenders or snipers. The tank crews were local soldiers well acquainted with the area and who knew the strong points to shoot at. The Israelis raised their national flags on the tops of buildings as they advanced, thereby providing their aircraft and artillery with a clear indication of their forward positions. Covered routes were blasted through houses to enable ammunition (consumed at a very rapid rate) to be moved forward and casualties to be taken to the rear. Between 7:00 and 8:00 a.m., most of the American Colony had been cleared.

By 6:00 a.m. one of the paratroop companies of the 6th Battalion fighting in the northern perimeter seized the Ambassador Hotel after a battle which lasted 2 hours. This building dominated the roads in that part of the city leading into the Sheikh Jarrah district and to Mount Scopus. From there the Shermans and half-tracks were able to make the first land contact with the Israeli enclave on Mount Scopus. By 7:00 a.m. all the Jordanian main positions had been overrun, but the paratroops were still fighting from house to house everywhere. But 10:00 a.m. the 7th Battalion had forced its way as far east as Wadi al-Juz and as far south as the Rockefeller Museum.

Meanwhile the 8th Battalion, whose starting line was near the Mandelbaum Gate, crossed the Armistice Line at dawn (about 4:15 a.m.). Its company of Sherman tanks blasted a way through the Jordanian defenses, then moved southward along the Nablus Road through the American Colony district toward the Old City. It was ordered to turn east off the Nablus Road on to Saladin Street to clear the area just opposite Herod's Gate close to the Rockefeller Museum. At this stage the Israelis planned to break through into the Old City by way of Herod's Gate (located in the center of the north wall). However, the paratroopers missed the turn onto Saladin Street and inadvertently proceeded south along the Nablus Road and nearly succeeded in reaching their objective. By 10:00 a.m. they ended up occupying Schmidt's Girl's College at one end of Suleiman Street near the Damascus Gate. Elements of the 7th Battalion occupied the Rockefeller Museum covering Herod's Gate at the other end of the street.

By 10:00 a.m. the areas penetrated by IDF forces fell quiet. The lull was broken only by an occasional grenade explosion or a sniper's shot. All the Arabs--both soldiers and civilians--had hastily evacuated eastward leaving the streets and houses deserted. The Israelis had captured at least 200 Jordanian soldiers, mostly wounded. The rest of the Jordanian forces had withdrawn successfully. Ata Ali had withdrawn his command post from Karm al-Alami into the Old City to avoid being cut off. He established a new command post in the basement of the Armenian Convent on the Via Dolorosa.

IDF forces needed a respite to rest and replenish, and about an hour of calm passed between 10:00 a.m. and 11:00 a.m. when it looked like they might get it. However, shortly after 11:00 the Jordanian forces in the Old City recovered from the shock of the Israeli breakthroughs. Soldiers lined the walls of the Old City and sniped at anyone who moved. Observers also directed artillery and mortar fire into any vehicle in sight. The Israelis were often pinned down in their positions. The slightest movement attracted Jordanian fire which seriously hampered reorganization and supply.

On the southern perimeter a battalion of the Jerusalem Brigade, with a company of Shermans, launched an assault against Sur Bahar at dawn. This unit succeeded in clearing most of the Sur Bahar Feature but failed to occupy it in its entirety. Thus, it was unable to completely block the road from Jerusalem to Bethlehem. At noon a second battalion from the Jerusalem Brigade with another company of Shermans crossed the Armistice Line where it cut through the district of Abu Tur, located between Government House and Mount Zion. The western part of Abu Tur was in Israeli territory but the eastern part was held by Jordan. The Jordanians held a fortified area on the high ground just south of the Old City which overlooked the Jerusalem railway station. After penetrating the outer defenses, the Israelis soon became bogged down in fierce house-to-house fighting. By 7:00 p.m. they had cleared a small area near the Pool of Siloam, but they came under increased mortar fire from the Old City as darkness fell. In addition to taking other casualties, the battalion commander was killed; so the unit withdrew to Abu Tur.

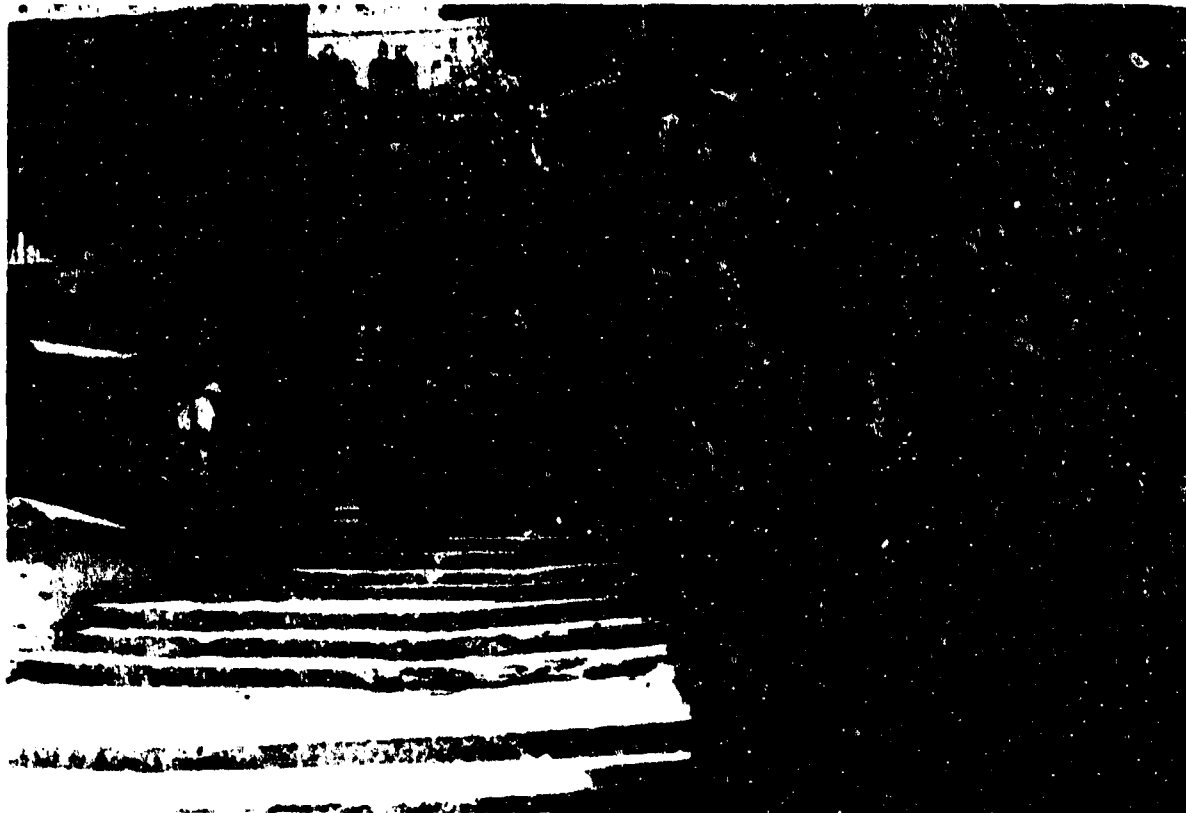


Figure 1. IDF Units on Arrival at Damascus Gate.

The Israeli positions in the built-up areas around the Old City were dominated by a higher ridge to the east, just south of Mount Scopus, on which stood the Augusta Victoria Hospital. This compound overlooked the Sheikh Jarrah and the American Colony districts. While Brigadier Narkiss was eager to assault the Old City, the IDF General Staff recommended that this potentially dangerous high ground to the north and east of the Old City (Augusta Victoria Ridge, the Mount of Olives, and the El-Tur Feature, the latter controlling the road from Jerusalem to Jericho) be taken first.

Narkiss was given permission to attack the Augusta Victoria Ridge. For the task he selected the 7th Battalion (with its Sherman company) that had reached the Rockefeller Museum. The assault began at 1:00 p.m. with the Shermans providing fire support from static positions. However, as soon as the jeeps and half-tracks emerged in the open, six of them were destroyed within minutes by Jordanian antitank guns from the Ridge itself. Mortar fire from the Old City caused additional casualties. One problem was that the Shermans were sheltered behind buildings. Therefore, they could not provide effective fire support to the paratroops. After two air strikes against the Jordanian guns on the Augusta Victoria Ridge failed to silence them, the attack was called off with the intention of mounting a second assault after nightfall.

The same battalion with its company of Shermans was employed in the second assault which was preceded by an air strike on the Ridge. This time the Shermans led the way with their guns firing. The attack failed nonetheless, primarily because the tanks missed a turn near the Rockefeller Museum and continued west on Saleiman Street only to become exposed to antitank fire from the walls of the Old City. Within minutes Jordanian antitank fire had disabled three Shermans and five other vehicles. This assault was also called off. A second night assault was called in order to meet an anticipated Jordanian counterattack.

To summarize: after heavy fighting the Israelis had successfully assaulted and taken the area to the north of the Old City of Jerusalem, linked up with Mount Scopus, and cleared Jordan's northern defenses as far as Ramallah. However, the afternoon and evening attacks by the IDF against Augusta Victoria Ridge were unsuccessful, and a night attack on it was cancelled. To the south the Sur Bahar Feature had not been completely occupied and the road between Jerusalem and Bethlehem was still open to the Jordanians while the area near the Pool of Siloam had to be evacuated again at dusk.

All of the Jordanian gun emplacements had been taken out except for two within the Old City which were still firing. The only positions outside the walls of the Old City still in Jordanian hands were Shufat Hill cut off from Jerusalem by Israeli paratroopers north of the wall, Augusta Victoria Ridge between the Mount of Olives and Mount Scopus, and the upper southern perimeter--Abu Tur, al-Tur, and Ras al-Amoud. The latter position was a reinforced police post on the southernmost slope of the Mount of Olives. The plan worked out by Ata Ali was to maintain diversionary strong points at Abu Tur, Ras al-Amoud, Augusta Victoria Ridge, and Shufat Hill; these positions having been reinforced by survivors of the battles on Ammunition Hill, UNRWA compound, and Wadi al-Juz to keep the IDF occupied



Figure 2. IAF Attacking Jordanian Trench Near Augusta Victoria Ridge

all through Tuesday (June 6) and thereby delay any concentration against the Old City in hopes that a Jordanian counter-attack could relieve the situation. (Ata Ali had received a wireless message from King Hussein promising a counter-attack the night of June 6.) The Old City had sufficient ammunition on hand, but medical supplies were exhausted.

At 10:00 p.m. June 6, the main part of the 2nd Battalion of the 60th Armored Brigade attempted to break through to Jerusalem from Jericho. The plan was to proceed halfway by road, then to continue across country to the Mount of Olives. However, Israeli air attacks had delayed the planned departure from Jericho. The brigade commander, in his eagerness to relieve the desperately hard-pressed troops in Jerusalem, decided against this cautious plan and instead decided to dash up the hill in trucks until he reached the roadblock created by the vehicles left after the destruction of a Jordanian relief column the previous night. At this point he planned to dismount his troops and advance on foot past the Mount of Olives. Shortly before midnight, the brigade's advance guard reached the roadblock and began to dismount, just as the movement was discovered by the Israeli Air Force (IAF). Israeli artillery and air strikes thereupon caught the entire column on the road, bringing it to a halt and inflicting heavy casualties.

Gur postponed his final assault on Augusta Victoria Ridge until daylight on June 7th in order to avoid another failure in the confusing lanes and fortification of Augusta Victoria Ridge. However, Gur was told to push the attack as quickly as possible in order to be able to seize the Old City before the United Nations imposed a ceasefire. Concerned about the ceasefire, Gur decided to risk a frontal assault by the 7th Battalion up the slope despite the fact that in daylight they would be exposed to fire from the Old City wall at their rear as well as from Augusta Victoria trenches in front of them. The 6th Battalion would simultaneously attack along the crest from Scopus. The 8th Battalion was to concentrate near the Rockefeller Museum in order to move into the Old City through Saint Steven's Gate (also known as the Lion's Gate) in the east wall as soon as the heights overlooking it had been taken.

At 7:00 a.m. heavy artillery fire was put down on the Augusta Victoria Ridge and other positions in the vicinity while the attacking battalion formed up. This was followed by a heavy air strike. At 7:30 the 7th Battalion, under an artillery barrage, began the assault from the area around the Rockefeller Museum and Wadi al-Juz. This time, however, the Shermans led the way, firing as they went. Jeeps equipped with recoilless rifles followed the tanks with paratroops in half trucks following behind the jeeps. The 6th Battalion moved to Mount Scopus and then assaulted southwards along a narrow ridge in half-tracks led by Shermans firing in all directions. Mortar fire was directed onto the walls of the Old City to keep the defenders' heads down. Advancing almost without opposition, this two-pronged assault swept across Augusta Victoria Ridge to find it deserted, the Jordanians having withdrawn before dawn.

Once Augusta Victoria Ridge had been secured, the 7th Battalion turned south and took the al-Tur district and the Mount of Olives. IDF forces now blocked the road from Jerusalem to Jericho at al-Tur.

The Israeli assault on the Old City began at 9:30 a.m. The Shermans advanced down the Jericho Road with their guns firing, followed by paratroops in half-tracks and jeeps charging across the broken ground on either side of the roadway. Mortar fire was put down on the Old City and recoilless guns fired on the ramparts. A 10-minute artillery barrage was put down on the Muslim Quarter, immediately adjacent to the Saint Steven's Gate. The 8th Battalion was ordered to break through at Herod's Gate on the north wall, but as this proved too strong, the 8th moved around the center making for the Saint Steven's Gate (Lion's Gate). This was a narrow aperture that admitted only one vehicle at a time. It was approached by a roadway over a moat, the footwalk of which was flanked by 4-meter high stone outer walls. The gate itself was blown open by a shell from a Sherman. Heavy armor could not pass through the gate (which was more accessible than any other of the gates), so the IDF stormed the shrine by foot and in jeeps. The column, led by Gur, charged through the gateway and turned south toward the Temple Mount, the dominant feature in the southeastern part of the Old City. Just inside the city Colonel Gur was met by the Governor, Anwar al-Khatib, the mayor, and city officials who informed him of their decision not to defend the Old City. By the time the IDF had penetrated the Old City there remained at most 10 to 15 Arab soldiers and armed civilians left to face them.

Outcome

The outcome of the battle of Jerusalem left the IDF in control of the entire city; the remnants of Ata Ali's forces having withdrawn from the Old City to Jericho during the night of June 7.

Findings

This section reviews some of the more important findings in the battle of Jerusalem. The battle was fought as part of a full-scale war between well-armed adversaries. According to Israeli Defense Ministry sources, Jerusalem was the scene of the toughest fighting of the June War of 1967. It was in the battle for Jerusalem that Israel took its most severe casualties, during this sole instance of house-to-house combat. This finding is all the more significant when it is remembered that neither the Jordanian soldiers nor the civilians were very well prepared to fight within the city. In addition, it must also be kept in mind that both sides were constrained in the use of weapons and tactics, particularly in the Old City, because of their extreme reluctance to damage any of the shrines or historical sites there. While this latter consideration is important in understanding the outcome of the battle--particularly the lack of organized Jordanian resistance within the Old City--the very fact that this restraint was common to both sides underscores another valuable lesson--the Jordanian defenders exacted a very heavy toll upon the Israeli attackers even though the Jordanians were not very well prepared to fight within the city. The outcome of the battle and the lack of preparation by the defenders in



Figure 3. Paratroop Command Group on Mount of Olives Just Prior to Breakthrough Into Old City. Commander, Col. Mordechai Gur, is fourth from left.



Figure 4. Tanks and Paratroops Using Stone Walls for Cover Just Prior to First Attempt to Assault Mount of Olives (background).



Figure 5. IDF Paratroops Move Toward St. Stephen's Gate. The headquarters units is in the half-track at right. Second tank from left (only partially visible) was knocked out during the previous night's attack on the Mount of Olives.

certain key areas (to be reviewed below) underscores what may happen in the absence of both preparation and communication between the authorities and the populace. There appeared to be a singular lack of trust or common identity between the population, on the one hand, and the army and government, on the other. Nevertheless, the battle of Jerusalem was the costliest campaign for Israel in terms of numbers of dead and wounded in proportion to troops committed.

Weapons

Clearly the tank and the APC were the most useful weapons for the attackers as long as they were used together. When tanks were separated from mechanized infantry, they became more vulnerable to Molotov cocktails or bazooka fire from upper-story windows.

For the defenders, probably the most important weapon was the obstacle--or lack of it. There were relatively few streets in Arab Jerusalem through which tanks and mechanized infantry could pass rapidly. Obstacles such as disabled tanks on narrow streets meant that the rest of the column had to turn back or the infantry dismount.

Air strikes were useful only against targets located at some distance from friendly forces and do not appear to have had much tactical value. Artillery had some effect on prepared enemy positions, particularly enemy artillery emplacements. However, much of the success achieved by artillery support was accomplished because Israeli artillery men had a thorough knowledge of enemy urban terrain and knew the position of each building and its range long before the war began. Artillery was of negligible value to the Jordanians in their massive shelling of New Jerusalem. One reason was the very nature of built-up terrain. IDF officers pointed out that the trajectory of Jordanian 25-pound shells was flat. They struck the houses and high walls but did not reach the streets. Their ability to cause damage in a city built of stone like Jerusalem is minimal, and a stone wall served as efficient protection against them. Another reason was the way the Jordanians used their guns. Their artillery units appear to have divided Israeli Jerusalem among themselves, each battery hitting its section without any attempt to coordinate the fire. About 6,000 shells fell on Israeli Jerusalem, the bulk of them in the first 24 hours. Of these shells 500 were duds, indicating something terribly amiss in the Jordanian armories. In addition, Jordanian artillery fire reflected an absence of planning. For example, Jordanian artillery concentrated considerable fire on residential neighborhoods, while nearly ignoring a 120mm mortar battalion located in the Valley of the Cross about 2 kilometers behind the city line. This mortar unit constituted the principal artillery support for the IDF in Jerusalem. Their position was no secret to the Jordanians since it could easily be viewed from a heavily traveled road on the Arab side of the line.

The extended point defense used by the Jordanians can be said to have been effective only in the sense that the advancing Israelis sustained such high casualties in proportion to the number of troops committed. There was no advance planning for fighting within the city. There was no attempt to exploit what may be the Achilles' heel of Israeli dependence on

armor for fighting in urban terrain—the fact that tanks are confined to main thoroughfares in order to sustain the momentum of the attack. This was particularly important in Arab Jerusalem where, as Gur pointed out, there were very few places apart from the main streets where tanks could move fast. There was no attempt to obstruct these main streets with rubble, overturned vehicles and the like, to block the IDF's advance. There is little evidence of organized attempts by the defenders to hamper IDF movement. Israeli soldiers reported that the Jordanians fought very well in small groups of three or four but seemed incapable of executing company or even platoon movements.

Tactics

Israeli tactics during the battle of Jerusalem appear to have been very effective. The IDF believed as a result of the battle that casualties can be minimized particularly while positioning infantry and engineers to seize key objectives. Direct-fire support from tanks preceding APC-borne troops provide an effective substitute for artillery which is of marginal use, at best, once friendly forces are inside the city. An example of what can happen when armor is separated from mechanized infantry can be seen in the first abortive attempt to take Augusta Victoria Ridge. The assault began with the tanks providing fire support from static positions behind buildings. As soon as the jeeps and half-tracks emerged into the open, a half-dozen of them were destroyed in as many minutes by Jordanian antitank guns. Sheltered behind buildings, the Shermans were unable to provide effective supporting fire to the attacking force.

Command, Control and Communications

Command, control and communications (C³) were decentralized on the Israeli side, unintegrated on the Jordanian side. That is to say, C³ on the Israeli side appeared to function satisfactorily and as expected. On the Jordanian side decentralization of command meant loss of control.

Jordanian command and control was both decentralized and unintegrated. It was unintegrated in the sense that Ata Ali did not have command of the several forces in the Jerusalem area. One consequence was that he had no direct communication with any of these detachments but could only learn of their situation or relay orders through these units' respective brigade headquarters. The basic forms of communications were the telephone and the wireless. The total strength of Ata Ali's force was some 5,000 men, plus the assistance of a small Palestinian militia of fewer than 1,000 men. Supporting this garrison to the north, east, and south were forces totalling perhaps another 5,000 men, including about 80 tanks. There were no provisions, however, for coordinating these forces with those of Ata Ali.

Overall control was vested in the Governor, Anwar al-Khatib, who attempted to coordinate mobilization of the civilian population through the creation of popular defense committees. Contact between the Governor and Ata Ali was fairly continuous as the Governor was frequently at Ata Ali's command post. However, one reason the Governor joined Ata Ali in his CP was the disappearance of the Governor's liaison officer from the Jordanian Army (along with most of the Governor's staff) when the fighting started.

When the war came all of the popular defense committees had dissolved except for one in the Old City. However, the resistance committee within the walled city was unaware of how desperate the situation had become by the end of the day on June 5. The committee's staff members decided to leave the HQ for their homes and return early on the morning of the 6th in the hope of an arms delivery. Consequently, the committee was cut off from the Old City before dawn; and from early Tuesday morning civilian resistance was to become a purely personal, unorganized affair.

A distinction should be made between the continuing ability of the indigenous municipality structure to function during the fighting in contrast to the central government apparatus which seemed to melt away within the first few hours of the fighting. Mayor Rouhi al-Khatib's municipality within the Old City continued to function with all personnel and department chiefs remaining at work and many staying at their posts through the night. Essential municipal employees outside the Old City also remained at their posts. These included the fire brigade HQ just northeast of Herod's Gate, the electric company HQ, the generator stations, and the three electric substations. When the power lines were disrupted, it was the municipal electric company crews who managed to get out of the city under fire and make repairs that were impossible for the Communication Ministry employees. One conclusion to be drawn is that indigenous Palestinian institutions managed to hold up under the strain of war, whereas the more elaborate national bureaucracies and infrastructure collapsed or failed to perform.

Command and control was more clearly defined for the attacking IDF forces, but nonetheless decentralized. Local commanders had substantial authority to act in accordance with conditions on the battlefield as they perceived them. Battalion commanders were expected to coordinate joint operations between them when the situation called for it with only loose direction from the brigade commander. Colonel Gur at one point had second thoughts about leaving most of the operational decisions to his battalion commanders, particularly when a battalion was encountering serious difficulty.

On the one hand Gur's experience and military training persuaded him that it was sound policy for a commander to rush to the aid of a subordinate in trouble. On the other hand, leaving a command post and risking the loss of contact and control of the fighting in other areas seemed to be contrary to the dictates of good sense. Gur's CP on the rooftop of an apartment building at 72 Zephaniah Street enabled him to remain in radio contact with his battalions in the field and the Central

Command. The rooftop provided a clear view of the entire battlefield. An effective reaction to any counterattack by the Jordanians made centralized control at the brigade level essential. A compromise between centralized control and decision autonomy at the lower levels was made by putting the brigade commander's second-in-command in charge when more than one battalion was involved in an operation.

Problems with communication occurred when attempts were made to establish radio contact within buildings. A more serious problem developed in the communications between the infantry and the tanks. The infantry men wanted to alert tank crews to choice targets, but the telephones linking the tanks to the outside world were either unusable because the cable had been cut by shrapnel or bullets, or else these external telephones had had to be switched off so the tank commanders could concentrate on the internal phones, over which came a stream of orders throughout the fighting. The result was that the effectiveness of the partnership between infantry and armor was marred by the frustrations of being unable to communicate.

Innovations

The only weapons developed for MOUT application were two devices developed by the IDF. The first was an explosive charge specifically designed to demolish stone block houses which were nearly impervious to bazooka or recoilless rifle fire. The second was a catapult device designed to sling a heavy explosive over a short distance--say, 200 meters--with very high accuracy.

Israeli forces raised flags over cleared buildings to assist in the direction of supporting fires and provide indications of progress to the rearward CP. However, Jordanian soldiers reentered cleared buildings in early stages of the fighting complicating Israeli battle management and harrassing the IDF.

Tunnels dug in the first Arab-Israeli war during the siege of Jerusalem were used by the IDF to move supplies forward. Some wounded were also transported rearward of the FEBA in this manner, although tunnel use for this purpose seems generally to have been neglected.

In built-up areas passages were blown through walls to facilitate movement of forces, a phenomenon later used in Beirut fighting. This approach replaced fire-and-movement to some extent.

FINDINGS AND CONCLUSIONS

Both Jerusalem and Suez City battles were fought as part of general Arab-Israeli wars. Neither battle was the most significant engagement of the larger conflict. In each case there were other instances of city fighting (though no major instances in 1973), but Jerusalem and Suez were clearly the most important examples of MOUT in the 1967 and 1973 Middle East Wars, respectively. Yet, ultimately, the outcome in each case was probably of greater political than military significance. Indeed, by the time these city battles began in earnest, the military outcome of the war had already been determined (though all participants did not understand this fact).

The attacker in both cases was a fully mobilized Israeli Army that enjoyed theater air superiority. The IDF enjoyed great momentum at the time of each engagement, numerical superiority in armor, and far greater mobility. Although a majority of the offensive forces were reservists (as the IDF is principally a reserve army), they were constituted in regular armed forces units and behaved as regulars. By contrast, the majority of the forces defending Jerusalem and Suez were irregulars or scarcely-trained reservists.

Even within these similarities there were marked differences between the two cases. For example, Israelis attacking Jerusalem were intimately familiar with the city, and many lived there. Others had grown up in the Old City. Jordanian Army defenders were not as familiar with the city, although irregular Jordanian forces, such as they were, were residents of Jerusalem. By contrast, no IDF personnel in the attacking forces were familiar with Suez, while most of the defenders lived there.

Another difference between the two cases resulted from the cultural value of Jerusalem. Because of its religious importance, neither Israel nor Jordan was prepared to see the city destroyed. Consequently, Israeli forces operated in constant awareness of the need to avoid undue destruction and restrict fire. In one case General Uzi Narkiss rescinded an order for retaliatory artillery fires into the Old City as soon as he heard the order over the radio net. Jordanian forces were equally determined to avoid artillery strikes on the Old City.

A more important but related distinction between Jerusalem and Suez is the preparation of the forces defending the city. In the former case, there was no preparation for hostilities by the Jordanians until the eve of the war, and very little even then. Local militias were not armed, buildings were not sandbagged, provisions not stockpiled. Apart from some minor, last minute fortification efforts, Jerusalem was unprepared for war. In this respect the contrast with Egyptian preparation of Suez could not be more complete. The Egyptians had begun to prepare for an attack on Suez a full year before the October War. Indeed, Suez City in October 1973 can be viewed as an urban trap for the IDF. Buildings had been demolished; kill zones demarcated; streets blocked; the populace armed, organized, and trained; and a realistic defensive plan developed.

Preparation of the city for defense appears to be more important than any other single variable in explaining the differential effectiveness of the resistance in Jerusalem and Suez. Idiosyncratic variables (such as the last-minute nature of the Suez operation) preclude systematic comparison, but the ability to act independently, reenter "secured" areas, and harass large numbers of attackers with small numbers of defenders clearly provides an enormous multiplier effect to the defensive forces.

The IDF doctrine for MOUT relied heavily on the use of armor in built-up areas in both 1967 and 1973. This reliance derived from the overall force structure of the IDF which was not designed principally for combat in urban areas and was encouraged by the effectiveness of armor in 1967.

Between 1967 and 1973 the IDF Armored Corps developed and refined its tactical concepts for MOUT, and began to instruct officer cadres, using live-fire exercises in real cities. However, less attention was given to combined arms training, and therefore, paratroop and infantry practices diverged sharply from armored doctrine. This neglect of combined arms operations was clearly visible in Suez City where armored forces, once they had recovered from the shock of the primary ambush, pushed ahead to the next objective while the paratroops dismounted their vehicles to fight in nearby structures.

In both the Old City of Jerusalem and Suez City, narrow streets impassable to tanks and APCs impeded or arrested the IDF advance, and in the latter, where the tank kill zones were engineered in advance, the narrow streets became alleys of death. Artillery had little effect on offense or defense, although both sides employed some artillery. Indeed, the single Israeli attempt to direct artillery shells on the Old City produced an aiming error that resulted in nine IDF deaths and many wounded.

The Suez City battle demonstrated the importance of C³, as had the Jerusalem experience 6 years earlier. In Jerusalem the decentralized but clear-cut Israeli lines of authority were highly effective for the small-unit operations of a city. By contrast, Jordanian command and control were not effectively integrated with the result that the senior local commander could not secure available armor or artillery support from units within his area of responsibility (but not under his command). These differences were exacerbated by Israeli communications superiority which allowed the IDF to intercept Jordanian communications, while Ata Ali was unable to communicate regularly with his own higher headquarters and other nearby units.

In Suez, IDF command and control was once again relatively decentralized but with very clear-cut lines of authority. Even after the disastrous ambush at the Arba'in intersection, effective Israeli communications probably saved the units involved, overcoming the severe handicaps caused by poor tactical organization and the resulting cutting off of three elements of the attacking force. Although radio communications from inside buildings was problematical at first, once order was restored the units within the city were able to reach several echelons of IDF command.

The Egyptian defenders acted on an almost individual basis, and command and control was scarcely tactical during combat. Operations were virtually unconventional in nature--in the urban guerrilla mold. The use of runners, telephone, and other highly appropriate communications channels characterized the defensive effort. Similarly, the command and control of the defenders, carefully organized long before the battle, integrated regular and irregular resources very effectively.

Jerusalem and Suez were good examples of the advantages MOUT confers upon the defender. Even in Jerusalem, the defense of which was virtually unorganized and certainly not tenacious, the IDF took much heavier casualties than in non-urban operations. Considering the fact that resistance was practically non-existent in the Old City where it could have had its most telling effect, the Jerusalem case shows what costs even an ill-prepared defender can exact on forces assaulting a built-up area. Similarly, the IDF disaster in Suez demonstrates that a well-prepared defender, no matter how poorly armed, can at least slow an enemy attack in a city and, if properly prepared, can tie down or decimate a much larger and well-armed force. Egyptian planning and tactics are a text-book example of how to exploit the cityscape as a force multiplier.

In both Jerusalem and Suez, defenders surrendered buildings to the attacking Israelis, only to re-occupy them once the buildings were cleared. This aspect of urban operations complicated the attacker's job by providing a constantly shifting battlefield situation in which there is no secure area. Although the IDF used flags in Jerusalem to indicate "secured" structures, the flags could not prevent Jordanians from re-entering. In Suez the proximity of buildings complicated this task even more, since cleared buildings could be re-entered at multiple levels by balconies or rooftops.

As in Beirut, holes were punched through walls in Jerusalem to facilitate the movement of men and materiel without exposing them to enemy fire. Tunnels, originally dug for the 1948-1949 battle of Jerusalem, were used to move supplies forward and, in some cases, to remove the wounded.

The Israeli BUZZ concept emerges as highly suspect following the Battle of Suez. However, BUZZ is based upon the idea that the shock effect created by rapid armored thrusts characterized by extremely intense multi-directional fire will cause a breakdown of the defenders' will to resist. This thesis may be particularly appropriate in the Middle East or in other circumstances in which a public unaccustomed to war is aware of a victorious momentum of the attacker. These elements may both be critical, however: a public unattuned to war, an attacker with strong momentum that is known to the public. In Suez the momentum factor may have been present, but despite the IDF's aura of invincibility, it faced a public inured to intense shelling as a result of the frequent bombardment of Suez City during the War of Attrition. Moreover, the Israeli familiarity with Jerusalem, which gave an unusual advantage to the attacker, was not present in Suez. The Israeli use of photomaps helped the attackers in Jerusalem and facilitated the evacuation of surrounded Israeli paratroopers from Suez, but even a photomap cannot replace the intimate familiarity of the residents, a characteristic conspicuously absent in Jordan's ill-fated defense of Jerusalem in 1967.

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APPENDIX

QUESTIONS FOR INTERVIEWS

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Planning and Tactics

1. What was the tactical plan for the defense of (Ismailia, Qantara, Suez City) from your standpoint?
2. How had the urban characteristics of the operation been exploited?
3. What equipment or tactical modifications were made for this MOBA operation?
4. How did Egypt prepare the city for defense? Were the preparations effective?

Operations

5. To what extent was rubble used? How? How was it created?
6. How were buildings used offensively and defensively?
7. What tools, devices, or weapons were used other than regular armed forces issue?
8. How were barricades used and what was their composition?
9. Did personnel try to shoot through apertures?
10. Was smoke used? How? Why? With what effect?
11. Was flame used? How? Why? With what effect?
12. To what extent did noncombatants impede offensive or defensive operations?
13. To what extent and how were snipers used? How effectively?
14. Was sniping integrated into defensive (or from your perspective) offensive operations?
15. How were snipers attacked or defended against?
16. Were there any subterranean operations? If so, what was their nature?
17. How were parallel, perpendicular, and other dependent street patterns used in offense and defense?
18. Were topographical features exploited by Egypt or the enemy?
19. How trafficable were streets after artillery shelling? Armor shelling? Mortars?
20. Did you observe modifications to enemy weapons to enhance MOBA effectiveness?
21. How did Egyptian personnel move within structures (i.e., vertically)? Between structures (i.e., horizontally)?
22. What was the distribution and deployment of personnel within buildings? (i.e., how many per floor or building? Which floors were favored for which types of operations?)
23. How were buildings cleared internally and externally?
24. What tactical organization was used? Were problems observed in C² that derived from the urban environment? What were they?
25. Were medical units used?
26. How were medical units configured?
27. What relationship existed between medical configuration and combat conditions?
28. What expedients were adopted in transportation, drugs, communications, hygiene, treatment of wounded and dead, evacuation, etc.?
29. How and to what extent did disease degrade operations?
30. Describe the C² of medical units.

31. How were casualties identified?
32. Break down wound types (flesh vs. serious, facial vs. thoracic, etc.)
33. Identify cause of wounds. In particular, note secondary wound effects.
34. What precautions were taken to guard against secondary wounds?
35. What equipment was used for communication purposes?
36. What frequencies (number, range) were used?
37. How much power did communications equipment have?
38. What were notable successes, failures, distances, and locations involved relative to communications?
39. What signals were employed?
40. What was the nature of netting?
41. Were scrambling or encrypting used?
42. Were night vision devices used? With what effect? What were they (brand, model, etc.)?
43. What differences arose, if any, between day and night operations?
44. What was the rate of ammunition expenditure, and how was resupply effected?
45. What sociological factors affected the nature of combat?

Equipment

46. What types of equipment seemed to you to be most effective in suppressing enemy fire?
47. What types of equipment seemed to you to be most effective in breaching walls?
48. What types of equipment seemed to you to be most effective in stopping assaults?

I would value any unsolicited comments relative to the employment, effects, or effectiveness of armor, artillery, AT weapons, hand-held weapons, AAA, mortars, or other systems.

Firing from Enclosures

49. What do you recall about the effects of firing specific weapons systems from enclosures--effects on the room, on the personnel firing the weapons, on the target? Any circumstances that can be recollected (room size, ventilation, number of rounds, ear protection, etc.) would be useful.

Holes

I have a series of questions concerning the creation, use, and circumstances surrounding holes in walls. These are event-specific, and may not be feasible to ask for an operation now five years old.

Air Support

50. Did offense or defense employ air support? Why or why not? With what effect?

Energy, Water, Telephone

51. Was the energy or water supply for the city's defenders interrupted? If so, how did this affect the defense of the city? If not, how was energy used (e.g., elevators)? Was telephone service out? Was it used by the defenders? How were these services gridded?

Conclusion

52. Were there any combat innovations you saw that were singularly appropriate to fighting in cities?
53. What would you do differently if you were faced with the same situation once again? That is, what lessons do you draw from the battle?